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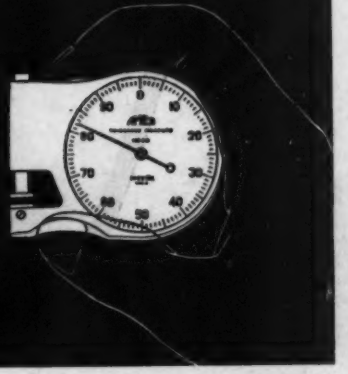
AMES THICKNESS MEASURE No. 25

The neatest, lowest priced, most accurate and durable dial pocket gauge made. Its case is only ¼" thick, dial diameter 1⅝", yet measurements up to 5/16" can be made by thousandths with great accuracy.



B. C. AMES CO., WALTHAM 54, MASSACHUSETTS, U.S.A.

INTERESTING FACTS ABOUT PAPER

In 1870, there were 33 factories in the United States devoted to the manufacture of paper collars in various colors.

Interesting Facts about Colors

Auramine 00 Now Available

Auramine 00 is NOW available in unlimited quantities for coloring Kraft and for other applications.

Many leading paper mills use H & M's Auramine 00 because of its natural affinity for unbleached fibres and for imparting a pure, clear, clean, yellow hue. Auramine 00 also dyes bleached fibres with excellent results. It has valuable non-rubbing properties, excellent solubility, does not "feather"—but bleeds slightly on the wire and is somewhat sensitive to heat.

Ask for complete details on Auramine 00, from your H & M representative.

Heller & Merz Department
CALCO CHEMICAL DIVISION
AMERICAN CYANAMID COMPANY
Bound Brook, New Jersey
New York • Chicago • Philadelphia • Boston
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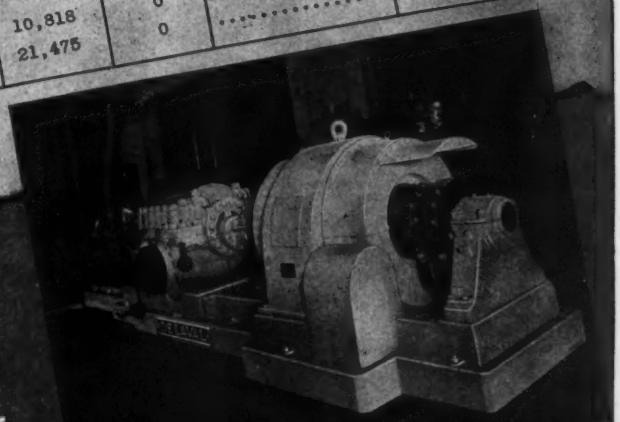
Look at the Record!

SERVICE RECORD—As of September 1, 1944

DE LAVAL PUMPS at _____

No.	Discharge Pressure psig	Suction Temp. °F.	Placed in Service	Total Service Hours	Outages Due to Pump	Cause of Outages	Approx. % Increase in Pump Power
14	1186	260°	12- 2-38	40,383	2	Replace ball locating bearing and shaft sleeves	Negligible
15	1186	260°	10-11-40	28,839	1	Replace shaft sleeves	Negligible
21	1186	350°	8- 4-39	10,818	0	.....	Negligible
16	1186	260°	1- 2-42	21,475	0	.....	5%

Capacity (all units).....1455 g.p.m.



of DE LAVAL HIGH-PRESSURE BOILER-FEED PUMP PERFORMANCE

Not one major trouble after as much as 40,000 hours of service!

The first of these units was installed in February, 1938; the most recent in February, 1942. All have demonstrated the satisfactory performance of De Laval boiler-feed pumps for high-pressure central station service.

Other important installations, operating at pressures up to 1600 psi and handling high temperature feed water, are operating with equal freedom from trouble, due in no small measure to the excellent performance of the De Laval automatic balancing device, the De Laval large clearance labyrinth wearing rings, and the sturdiness of De Laval solid end head construction.

3629

TURBINES • HELICAL GEARS • WORM GEAR SPEED REDUCERS CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS and COMPRESSORS • IMO OIL PUMPS

DE LAVAL

STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

SALES OFFICES: ATLANTA • BOSTON • CHARLOTTE • CHICAGO • CLEVELAND • DENVER DETROIT • DULUTH • EDMONTON • GREAT FALLS • HAVANA • HELENA • HOUSTON KANSAS CITY • LOS ANGELES • MONTREAL NEW ORLEANS • NEW YORK • PHILADELPHIA PITTSBURGH • ROCHESTER • ST. PAUL • SALT LAKE CITY • SAN FRANCISCO • SEATTLE TORONTO • TULSA • VANCOUVER • WASHINGTON, D. C. • WINNIPEG

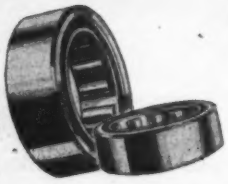
GREASES..ENGINEERED TO

BEARINGS . . . COOL AS A CUCUMBER

"Since we changed to Tycol Green Cast Grease, our bearings run cucumber-cool," says one chief engineer. No matter how severe the service, Tycol Green Cast Greases assure better lubrication . . . less maintenance. The reason? They contain more high-grade cylinder oil—less soap—which means better performance in every application.

NO COSTLY, TIME-CONSUMING REPAIRS

A well-known mill encountered the usual trouble of hot bearings and excessive wear on a huge mixer—the grease lost its body under heat, ran out of the bearings and damaged the machine—changing to Tycol Green Cast Greases changed this condition immediately. Tycol greases hold their body, prevent over-heating and wear on bearings and last longer.



COSTLY WEAR OF ROLLER BEARINGS STOPPED

"Tycol Green Cast Grease never leaves a soap or foreign deposit in the bearings," stated one operator. Gone is the worry over delays and costs caused by separation and breakdown of grease formerly used. Tycol grease resists breakdown in structure, thus assuring maximum lubrication.

TYCOL INDUSTRIAL

ENGINEERED FOR EVERY

"TAKE-IT"

ON THE

TOUGHEST JOBS!

Peak production . . . without worry of breakdown due to friction and wear . . . is made easier with Tycol Green Cast Greases.

Engineered to "take-it," without thinning down and dripping, Tycol Green Cast Greases avoid wasted lubricant, lost bearings and unnecessary "time out". These modern lubricants keep bearings . . . pistons . . . gears friction-free and cool. They supply the "film of protection" needed to give power a chance to produce with a minimum of waste.

Call your nearest Tide Water Associated office. Let them suggest the Tycol Green Cast Grease engineered to "take-it" on your specific problem . . . and remember, Tycol greases are made from high quality cylinder stock and well refined neutral oil, with a minimum of soap—a maximum of oil . . . more efficient lubrication per pound of grease.

PENETRATION

This informative handbook gives clear, concise descriptions of the basic tests used to determine important lubrication properties—Penetration, Viscosity, Pour Point

WHAT IT MEANS IN GREASE — SEE TIDE WATER "LUBRICANIA"

and many others. For your FREE copy, write to Tide Water Associated Oil Company, 17 Battery Place, New York 4, N. Y.

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SERVICE NEED

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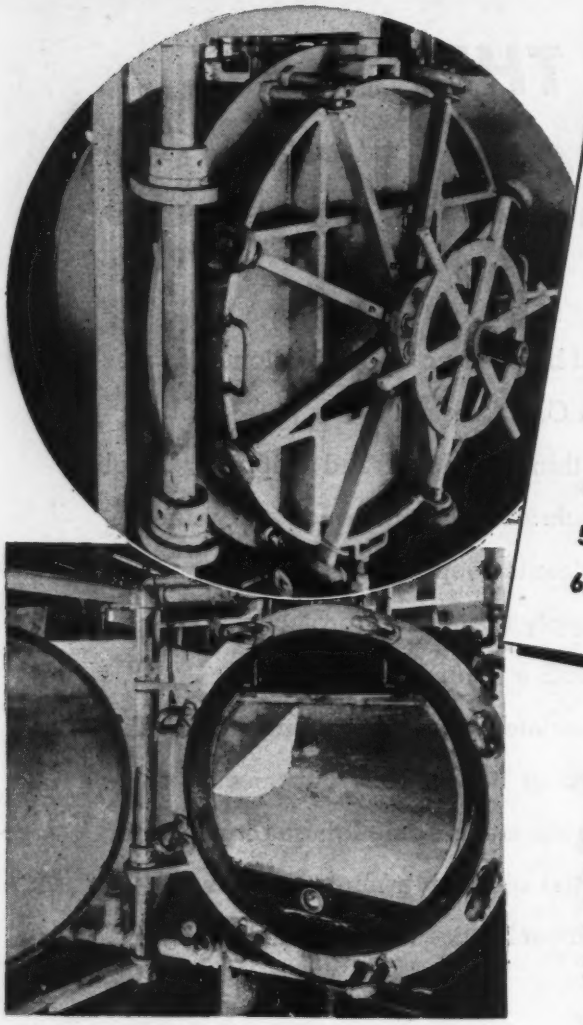
17 BATTERY PLACE · NEW YORK 4, N. Y.

PRINCIPAL OFFICES
BOSTON · PHILADELPHIA
PITTSBURGH · CHARLOTTE, N. C.

Removes ALL OIL from condensed returns used for boiler feed



Upper picture shows the Refiner with special quick-locking door in place. Lower photo shows door open. Note how filter bed is peeled easily from pressure leaves in one piece.

The REFINER

A revolutionary new filter PROVEN IN SERVICE

1. Eliminates oil entering boilers. Improves boiler efficiency. Reduces boiler maintenance costs.
2. Saves heat units and fresh water by clarifying contaminated returns formerly dumped.
3. Removes free and EMULSIFIED oil from water to less than one-tenth part per million.
4. Requires no chemicals or wasteful back-washing.
5. Is simple, inexpensive to operate.
6. Requires little space.

THE REFINER is an outstanding achievement in filters designed for extremely fine filtration. It breaks the tightest emulsion in condensate and removes both emulsified and free oil from an oil content as high as 90 parts per million down to a guaranteed maximum of one-tenth ppm.

The REFINER features compactness and low-cost operation. Flow rates of 20 to 200 gpm. are obtained in single units. A battery of units provides greater capacities. The cost of filtered liquid by this new method of emulsion breaking is extremely low. No back-wash water is used.

The REFINER will greatly step up the efficiency of your plant and reduce boiler maintenance costs. Engineering assistance will be furnished gladly.

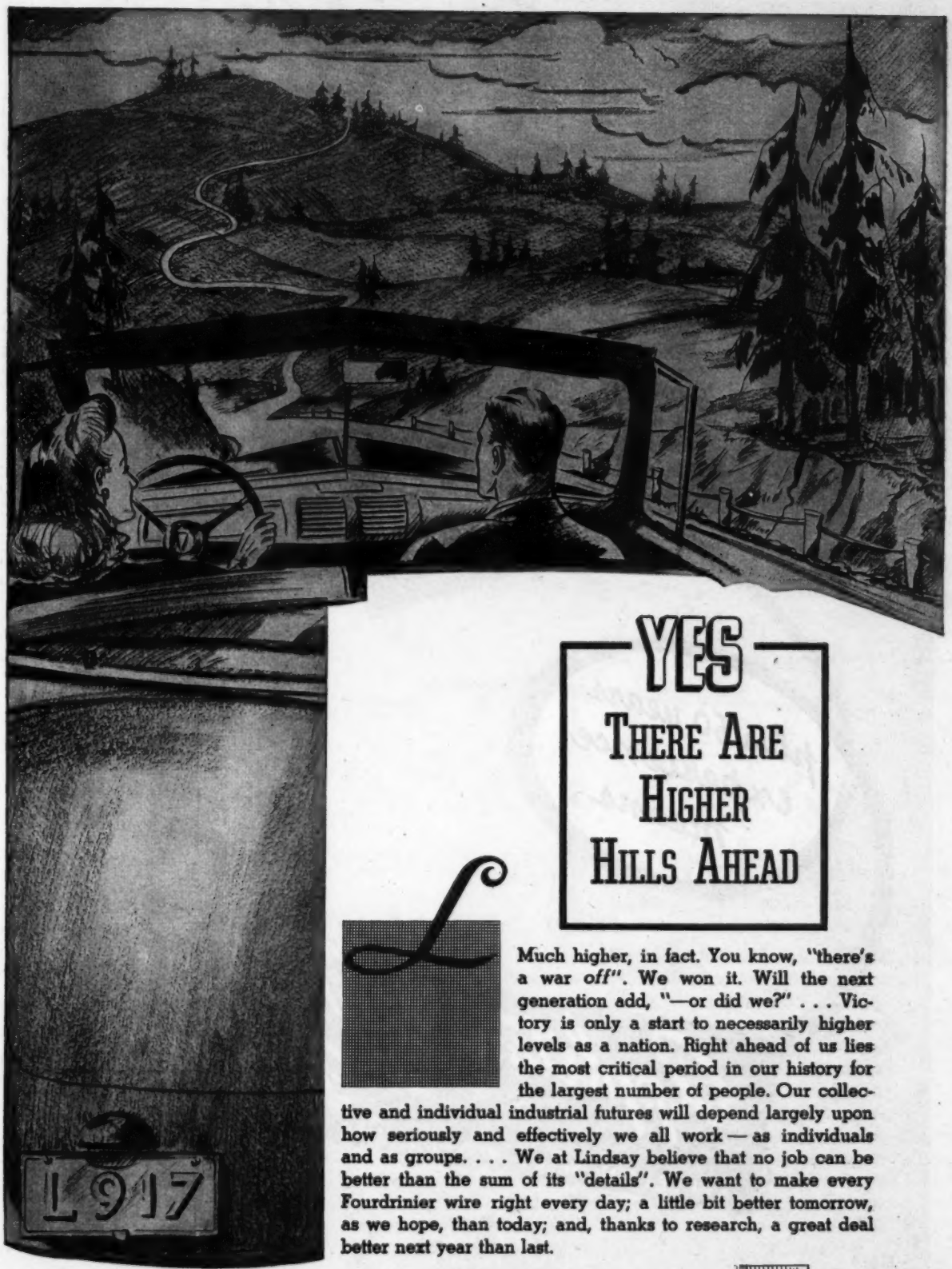
APPLICATIONS

The REFINER can be used as a polishing filter for practically any liquid, including boiler feed water and condensate, alcoholic, malt and other beverages, chemicals, aromatics, paints, varnishes, lacquers, soaps, detergents, juices and liquid foods, and liquids used in processing other substances. The pressure-tight cylinder permits filtration of volatile, inflammable, and hazardous liquids. It also removes turbid matter of the same specific gravity as the liquid.

WRITE FOR CATALOG

BLACKBURN-SMITH
MANUFACTURING COMPANY, INC.
For 60 years designers and manufacturers of filters.
72 River Street, Hoboken, N. J.

Blackburn-Smith Mfg. Co. is a wholly owned subsidiary of Condenser Service & Engineering Co., Inc., builders of Evaporators, Stage Heaters, Gas Coolers, Drain Coolers and Heaters, Aftercoolers, Air Preheaters, Fuel Oil Heaters, Jacket Water Coolers, Process Heat Exchangers, Transformer Oil Coolers, Generator Air Coolers, Lubricating Oil Coolers, Storage Tank Oil Heaters, Feed Water Heaters, Distillers, Industrial and Oil Refinery Heat Exchangers, and other types of heat exchange equipment.



YES
THERE ARE HIGHER HILLS AHEAD

Much higher, in fact. You know, "there's a war *off*". We won it. Will the next generation add, "—or did we?" . . . Victory is only a start to necessarily higher levels as a nation. Right ahead of us lies the most critical period in our history for the largest number of people. Our collective and individual industrial futures will depend largely upon how seriously and effectively we all work — as individuals and as groups. . . . We at Lindsay believe that no job can be better than the sum of its "details". We want to make every Fourdrinier wire right every day; a little bit better tomorrow, as we hope, than today; and, thanks to research, a great deal better next year than last.

THE LINDSAY WIRE WEAVING CO.
Serving the Paper Industry Since 1903
14025 ASPINWALL AVENUE
CLEVELAND 10, OHIO

Lindsay **WIRES**
FOR PAPER MILLS

APP-WELD
PATENTED
SEAMLESS
JOINT
plus 50 years experience means
Appleton Wires
are Good wires
APPLETON WIRE WORKS, INC. APPLETON, WIS.

10 ADVANTAGES

1. Extreme flexibility—easy to handle
2. Resists kinking
3. Light in weight
4. Practically inseparable cover and plies—balanced homogeneous construction
5. Withstands high pressures and surges with wide margin of safety
6. Uniform inside diameter
7. Less elongation and expansion
8. Less fatigue to operator
9. More production
10. Lower ultimate cost

Condor HOMO-FLEX HOSE

contributes to greater production and longer hose life

Every one of these 10 advantages contribute to the multiple economies of long service life; resistance to high working pressures and surges; easy handling with less operator fatigue; toughness to withstand wear, abrasion and kinking.

Still another **MANHATTAN** advantage—Turnate Vulcanization—imparts added strength to Homo-Flex Hose. This process gives uniform inside and outside diameters, uniform texture and resiliency to the **MANHATTAN** Strength Members and the **FLEXLASTICS** tube and cover.

Condor Homo-Flex Hose is or will be available in types for the following services: Air, Water, Steam Pressing Iron, Orchard Spray, High Pressure Mine Spray, High Pressure Oil Spray. Write for Bulletin No. 6879.

The term FLEXLASTICS is an exclusive MANHATTAN trade mark. Only MANHATTAN can make FLEXLASTICS.

ARMY E NAVY

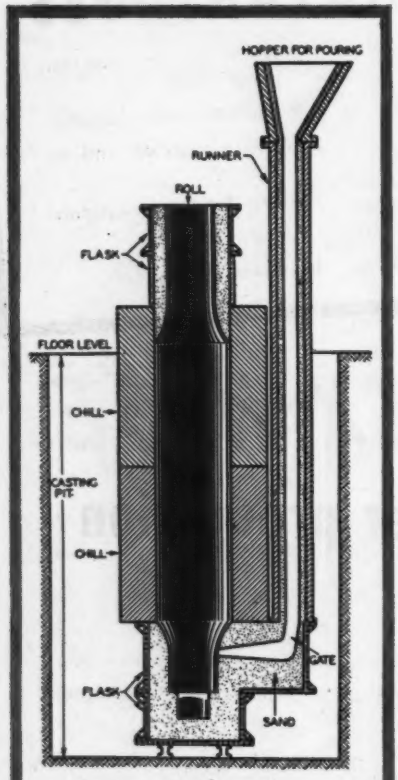
THE MANHATTAN RUBBER MFG. DIVISION

OF RAYBESTOS-MANHATTAN, INC.

Executive Offices and Factories PASSAIC, NEW JERSEY

THERE'S MORE TO A FARREL ROLL

than what meets the paper



The body of a calender roll is formed by pouring molten metal into an iron mold or chill. Iron being a good conductor of heat, cooling is rapid, causing the surface of the roll body to "chill" and harden. The body of the roll below the chilled surface cools slowly, forming a gray iron structure which gives strength to the roll. Sand molds are used for the necks, and, since sand is a poor conductor of heat, the metal becomes a gray iron composition with physical properties which make the necks strong, yet readily machinable.

Beneath the mirror-like surface of a Farrel calender roll lies evidence of how the experience and facilities of Farrel combine in making a roll that gives maximum paper-making service.

The white iron skin or chilled surface of the roll varies in depth from 3/8 inch in small sizes to 2 inches in large diameter rolls. While this chill provides an extremely hard surface capable of taking a very smooth finish, it is relatively brittle. The strength of the roll lies principally in the gray iron structure of the roll body. In every Farrel roll the thickness of chilled surface, intermediate mixed iron and gray iron body are combined in correct proportion to provide maximum service without danger of breakage.

To produce a clear chill of correct depth on rolls from 5" to 72" in diameter and up to 312" in face length, requires specialized experience and facilities—the kind of experience and facilities that Farrel has developed over nearly a century of casting, machining and grinding many thousands of different sizes and types of rolls.

Deep pits for vertical casting . . . iron chills in a complete range of sizes . . . pouring and handling equipment . . . special tools for machining . . . Farrel swing-rest grinders with the patented automatic crowning device . . . Farrel roll calipers—these are part of the facilities, operated by men of long experience in every phase of roll making, that you will find in *America's largest specialty roll shop.*

Write for information about rolls for specific applications or for details of any of the other products listed on this page.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia, Derby and Stonington, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles, Tulsa, Houston, Charlotte

FB

Farrel-Birmingham

FB 207

The Purchasing Agent

—HE, TOO, HAS SERVED WELL

TOO frequently the accomplishments of Purchasing Agents and their staffs have been overlooked in discussions of American industrial might. In emphasizing production records, Purchasing achievements in providing raw materials often are omitted . . . in praising scientific and technical advances, the ingenuity of Purchasing men in locating and obtaining scarce products frequently is unnoticed.

Yes, through long hours of diligent, resourceful work, American industrial Purchasing Agents have turned in a superlative job. In paying tribute to them, Columbia renews its pledge of continued co-operation to its customers' Purchasing Agents and their staffs as they face today's new problems and responsibilities.

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PITTSBURGH PLATE GLASS COMPANY • COLUMBIA CHEMICAL DIVISION

GRANT BUILDING, PITTSBURGH 19, PENNSYLVANIA

Chicago • Boston • St. Louis • Pittsburgh • New York • Cincinnati • Cleveland • Philadelphia • Minneapolis • Charlotte • San Francisco

COLUMBIA ESSENTIAL INDUSTRIAL CHEMICALS

Soda Ash • Caustic Soda • Sodium Bicarbonate • Liquid Chlorine • Silene EF (Hydrated Calcium Silicate) • Calcium Chloride • Soda Briquettes
Modified Sodas • Caustic Ash • Flocflake • Calcene T (Precipitated Calcium Carbonate) • Pittchlor

An obsolete plant power system will wean away the savings you expect from new machines

Keg YOUR

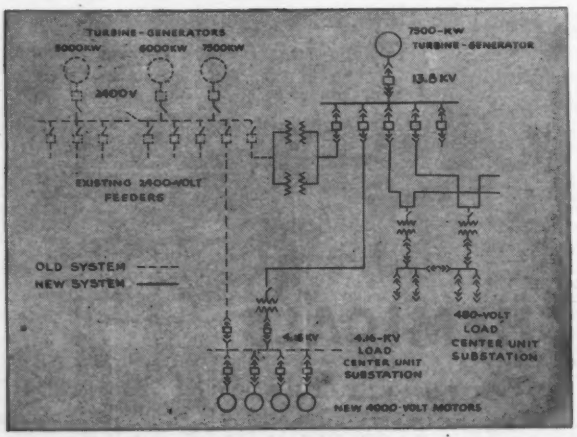
IN your plans for plant modernization and future growth, you'll find that it pays to break away from power-system practices that belong to the prewar era.

Take primary distribution voltage, for example: With the widening use of load-center unit substations, long, 600-volt "copper-hog" feeders are clearly obsolete, and even 2.4-kv primary circuits are open to question. The gains of a new machine or plant addition may be largely offset by long runs of heavy cable to handle the extra load.

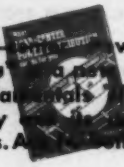
Similarly, high short-circuit currents are a frequent threat to safe expansion of large low-voltage systems. Load growth may require the use of reactors to keep short-circuit currents within the limits of the interrupting capacity of available breakers.

A modern, load-center system, with primary voltage keyed to future loads, solves both problems. Small, high-voltage cables lead to unit substations close to the load. The substation transformer sets a limit on the short-circuit interrupting duty of the secondary breakers, regardless of the power-system size.

Before you add *any* new power system equipment *piecemeal*, check with G.E. on the best ultimate layout for your system. Then, you can modernize step-by-step toward this ideal. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

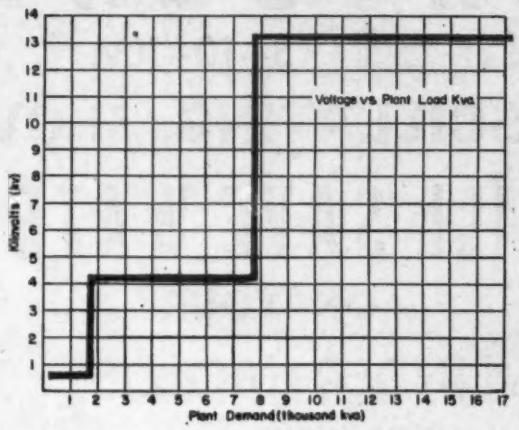


How new 13.8-kv turbine-generator was added to power system of large plant and interconnected through transformers to old 2.4-kv system.

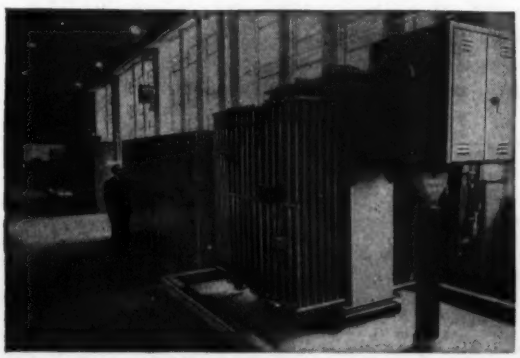


"What Load-Center Power Distribution Means to You" is a new booklet describing the fundamentals of modern plant-power supply and the application to all types of plants. Ask for bulletin GEA-3758B.

ECONOMICAL VOLTAGE LEVEL for primary feeders in new paper mills has been found generally to follow the red line on the chart at right. In special cases, particularly where generators and other equipment are already installed, an engineering analysis will show the best level for long-term economy.



PRIMARY VOLTAGE TO YOUR 1950 LOADS



5000-kva unit substation—13.8-kv primary—a type having wide applicability to large paper mills. Equipped with Pyranol* transformers, this substation can be installed anywhere in the mill without vaults.

Typical "double-ended" unit substation with 480/277-volt secondary as applied in secondary-selective load-center systems to protect power continuity.

* Pyranol is G.E.'s trade name for askarel, a noninflammable, nonsludging insulating liquid.

480-VOLT (600 or below) distribution from a central switchboard is definitely uneconomical where plant demand is likely to rise above 1500 kva before 1950. Replacement should be planned at once.

4.16-KV is best for plants of moderate size, in contrast to 2.4-kv distribution—the preferred voltage in the past. Motors up to 200-250 hp can be operated by load-center step-down to 460 volts at less dollars per hp than directly at 2300 volts. Above this level, 4000-volt motors may be used. Write for GEA-4275 for full explanation.

13.8-KV distribution proves best for big mills where long runs are needed to points of heavy demand. Your present turbines can be tied in to such a system by step-up transformers on a practical cost basis. Illustration opposite shows how present 2.4-kv system can be linked to new 13.8-kv supply.

Keep on buying BONDS—*and keep all you buy*

GENERAL ELECTRIC

THE BROUGHTON

S–10–XM

OSCILLATING SHOWER

WILL SAVE WATER

ON YOUR

CYLINDER MOLDS
THICKENERS
WIRES and
VATS

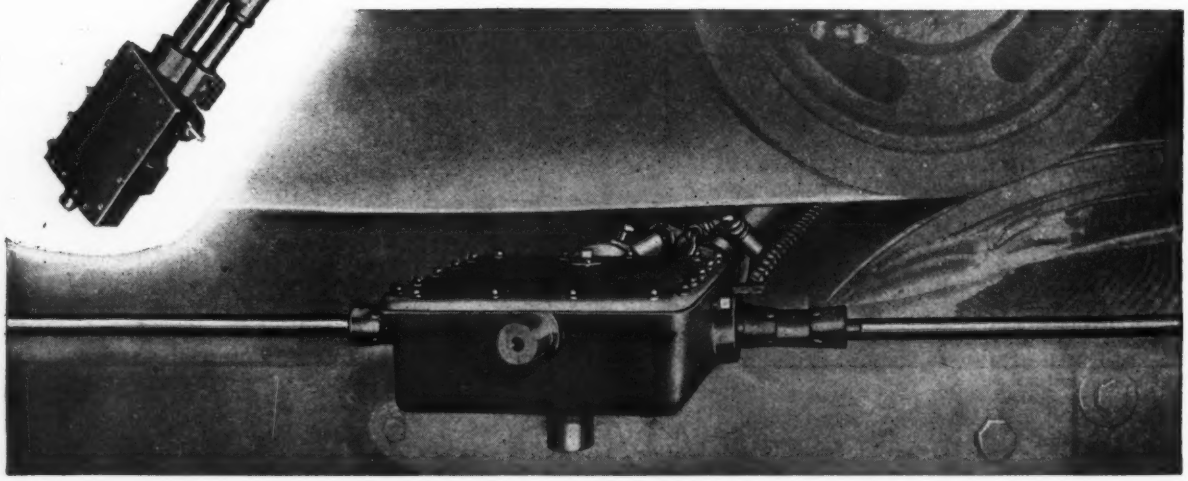
This mechanically operated oscillating shower requires less than 6 gallons per minute of fresh filtered water to do a thorough job of continuous cleaning of wire face. Water savings in many mills exceed 100,000 gallons during every 24 hours.

It can be installed on any cylinder mold and beneath the felt. It can be equipped with non-oscillating, adjustable deckle edge jets. This same shower can be applied in any position where a shower is necessary and will clean felts and Fourdrinier wires.

We are also the manufacturers of S-13-XM Showers for cleaning head box cylindrical screens.

Information and Drawings upon request.

Pat. November 3, 1942—2300909 (Other Patents Applied For)



A. E. BROUGHTON & COMPANY

Manufacturers of mechanically operated Oscillating Showers,
and Unit Vacuum Controls for paper machine suction boxes.

GLENS FALLS, N. Y.

QUALITY DYESTUFFS FOR PAPER

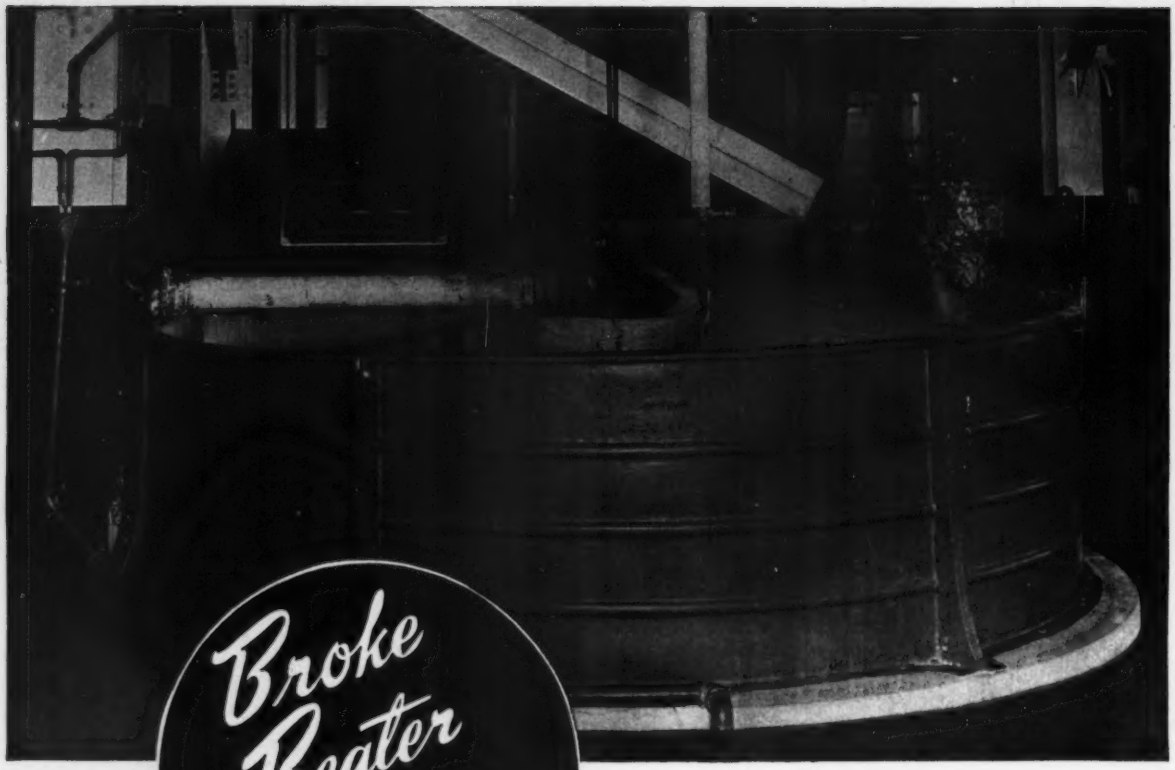
A complete range of dyestuffs for coloring paper by the continuous process, in the beater, at the tub, on the calender and in coating application. • • • •

Auxiliaries for pulp and paper mill use.

GENERAL DYESTUFF CORPORATION

435 HUDSON STREET • NEW YORK 14, NEW YORK

BOSTON • CHARLOTTE • CHICAGO • PHILADELPHIA • PROVIDENCE • SAN FRANCISCO



Broke Beater BY VALLEY

VALLEY has long been synonymous with high-performance beaters of all types. Here is one of a number of late pre-war installations of the famous Valley Broke Beater.

Our complete line includes Broke, Breaker, Paddle, Vortex and Hi-Speed Beaters of all sizes—as well as laboratory and semi-commercial beaters. Inquiries will be given full and careful attention.

VALLEY IRON WORKS COMPANY
APPLETON, WISCONSIN

Slices and Head Boxes • Screw Presses • Micro-Mist Spray Dampeners • Laboratory Equipment
Pulp Washing Systems • High-Speed Beaters • Breaker Beaters • Vortex Beaters • Plug Valves
Flat and Rotary Screens • Thickeners • Deckers • Paper Markers • Roll-Headers

THE TREND TO *Light-weight* STARTED HERE

REMEMBER your first experience with TITANOX pigments? Remember how you found in them the answer to many of your paper-making problems — how you attained whiter, brighter paper stocks with a minimum of pigment—and opacity such as you never before had achieved?

Then came the order to conserve. Lighter-weight stocks? Why not? TITANOX would give them the necessary opacity. So you came through with light-weight papers that have served well in the all-out effort to make the most of available raw materials.

You met a challenge and in doing so you started a trend — a trend toward new appreciation of the many advantages deriving from the use of light-weight papers. For, aside from the saving in raw materials, the train of economies set up by these thinner papers was considerable . . . lower shipping costs . . . less storage space . . . reduced mailing costs.

Thus light-weight papers were welcomed in many fields—to such an extent, indeed, that a demand for their continuance is evident even though the emergency has passed.

Our Technical Service Department will welcome the opportunity to help you in your post-war planning.

TITANOX

REG. U.S. PAT. OFF.

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT
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BACKGROUND FOR BETTER LUBRICATION AND IMPROVED PRODUCTION

Here's precision equipment developed by Gulf technologists capable of measuring the small frictional forces in bearings with extreme accuracy under almost any operating conditions, shaft speeds, loading, or temperatures. Such advanced testing in Gulf Research Laboratories has helped avoid many costly machine failures in industry.

This apparatus achieves nearly complete freedom from friction. The heavy shaft running through the lower part of the machine is supported entirely by a film of oil within the tube bearing housings at either end. The operator is demonstrating that the shaft may be easily turned with the fingers although under a total load of 5 tons!

Gulf Technologists

develop amazing new machines to get more facts on lubricants and bearings

IN the Gulf Research Laboratories, the age-old war against friction is being carried on with equipment as up-to-date as that which produced victory for our armed forces. Much of this equipment, highly specialized in purpose, has been designed and constructed by Gulf technologists.

From this continuous effort have come scores of remarkable additions to and improvements in Gulf's long list of quality petroleum products. Included in this list are Gulfcrest Oil, which actually gives years of service in steam turbines, cutting oils that have speeded up production and improved the quality of the work, internal combustion engine oils that hold carbon in suspension so that it can be drained out, and lubricants that won't foam under service conditions.

If you have a lubrication, cutting, or quenching problem, let Gulf co-operate with you in developing the best solution. Write, wire, or phone your nearest Gulf office today and ask a Gulf Service Engineer to call.

GULF INDUSTRIAL LUBRICATION

Gulf Oil Corporation · Gulf Refining Company

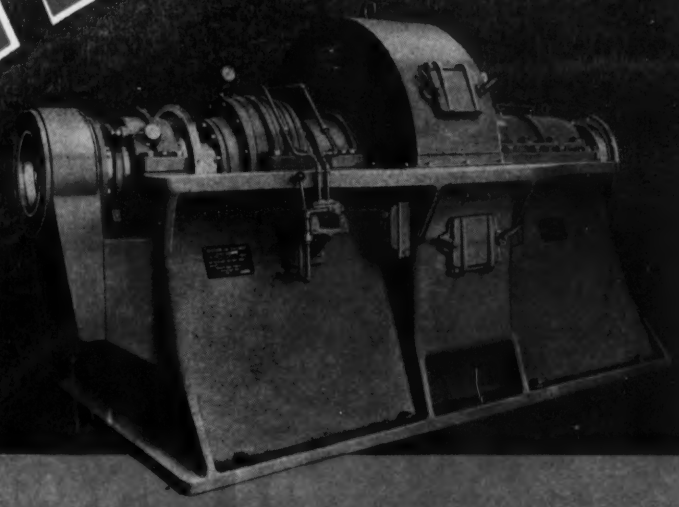
Division Sales Offices: Boston · New York · Philadelphia · Pittsburgh · Atlanta · New Orleans · Houston · Louisville · Toledo

Continuous

BEATING AND REFINING FOR EVERY PAPER MAKING FIBER

by

SUTHERLAND



SUTHERLAND REFINER CORPORATION . . . TRENTON, N. J.

SUTHERLAND REFINER LIMITED . . . . . MONTREAL, QUE.

PROVE TO YOURSELF! Compare

See How This Revolutionary New Method of —Bigger Savings—Higher Grade of Pulp Than is

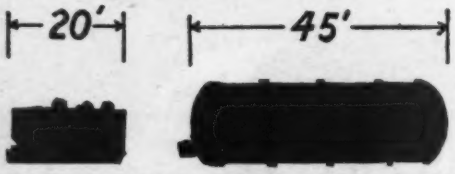
COMPARE WOOD LOSSES!

Many mills using out-moded barking equipment experience unnecessarily high wood losses . . . in saw kerf, brooming, through rossing, hand-cleaning, chipping, etc. In such mills A-C's new "Streambarker" *materially reduces* loss — because it can *eliminate* brooming, rossing and hand-cleaning — can *minimize* saw kerf and chipper loss!

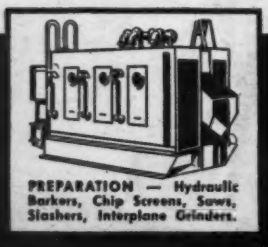
COMPARE OPERATIONS!

The old way—not only *higher* wood losses, but *more* equipment, *more* operations than with the new, improved "Streambarker" method! In many cases, "Streambarker" *can eliminate* slashers, rossers, hand-cleaning tools—*can reduce* number and length of conveyors—can clean logs better and at lower cost than by other methods!

COMPARE SPACE!



"Streambarker" requires *far less* space than conventional barking equipment. Compare its 20 by 7 ft. size with that of a 45 by 12 ft. drum barker and you *see* what we mean! By eliminating and simplifying related equipment it provides still more room, reduces housing cost! Want more information? Call or write for Bulletin B6341. A1964



PREPARATION — Hydraulic Barkers, Chip Screens, Saws, Slashers, Interplane Grinders.

COOKING — Digesters, Blow Tanks, Kilns, Slakers, Heat Exchangers, Condensers.

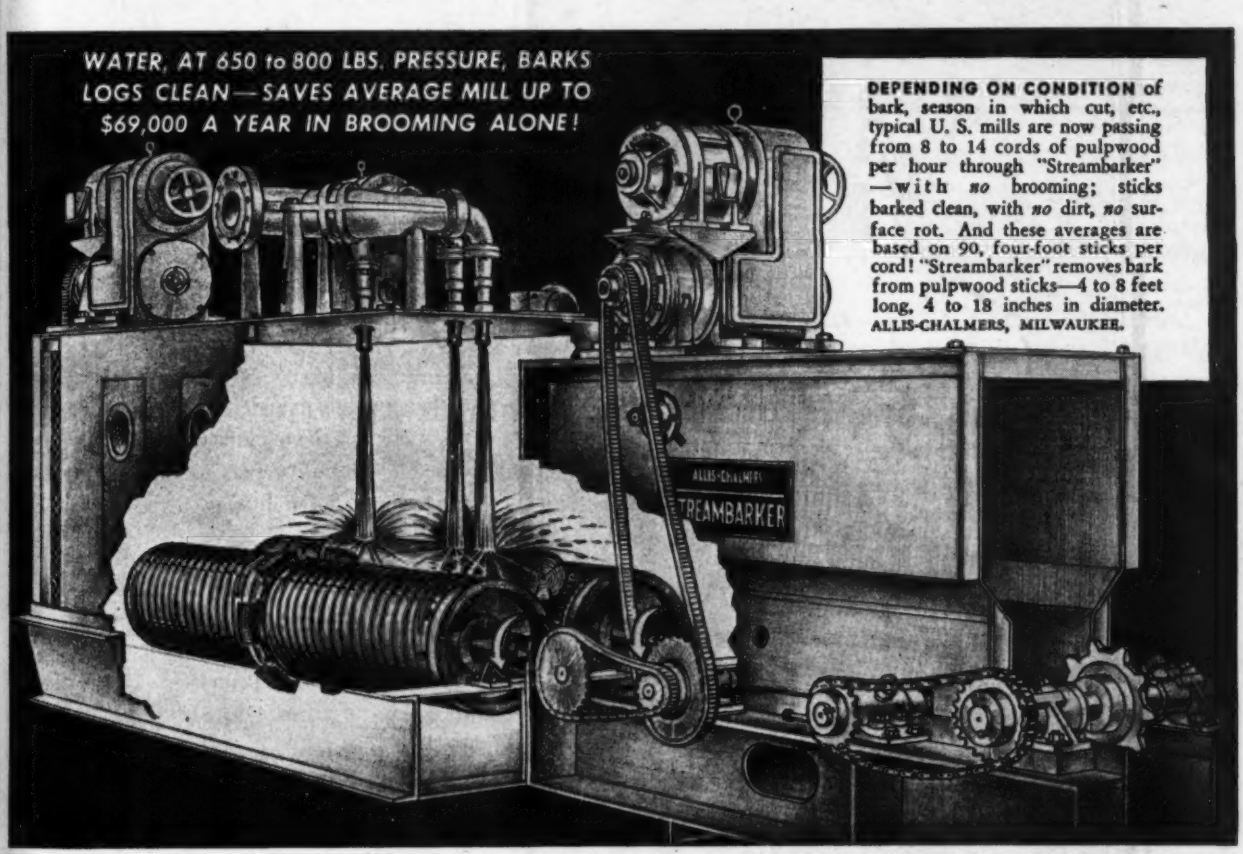
WET ROOM — vibrating-type screens for use as Thickeners, for dewatering rejects.

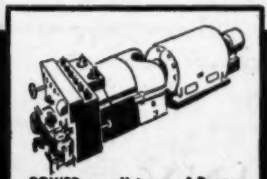
PAPER-MAKING — special design Drives for Paper Machines, Rewinders, Calenders.

ALLIS-CHALMERS

Streambarker

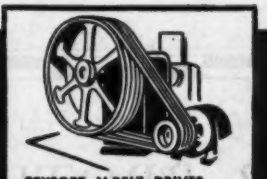
Hydraulic Barking Gives You Bigger Production Possible with Conventional Barking Equipment!


WATER, AT 650 to 800 LBS. PRESSURE, BARKS LOGS CLEAN—SAVES AVERAGE MILL UP TO $69,000 A YEAR IN BROOMING ALONE!
DEPENDING ON CONDITION of bark, season in which cut, etc., typical U. S. mills are now passing from 8 to 14 cords of pulpwood per hour through "Streambarker" —with no brooming; sticks barked clean, with no dirt, no surface rot. And these averages are based on 90, four-foot sticks per cord! "Streambarker" removes bark from pulpwood sticks—4 to 8 feet long, 4 to 18 inches in diameter. ALLIS-CHALMERS, MILWAUKEE.
STREAMBARKER

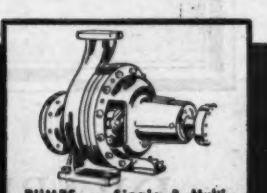


POWER — all types of Power Generation, Distribution and Control Equipment.

MOTORS & CONTROLS — all types a-c and d-c Motors, ½ to 7000 hp — Gearmotors.



TEXROPE V-BELT DRIVES — fractional to 5000 hp — Constant and Adjustable speed.



PUMPS — Single & Multi-Stage, 10 to 150,000 gpm — Paper Stock Pumps, Fan Pumps.

MILWAUKEE 1, WIS.

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 12 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS

West Virginia has nothing in common with the paper company one naturally associates with its name. Its place in papermaking history, if not important, is at least unique. According to Week's account, "a pioneer Methodist minister named Lamden founded the industry in West Virginia. He was proprietor of a paper mill built in Wheeling, on the Ohio River, in 1830. His son Christopher, had learned the trade of papermaking by hand in Steubenville, Ohio, and by machine in Massachusetts."

Apparently the minister-founder had no interest in the manufacture of so-called "cultural papers," for the product of his mill was tea and wrapping paper.

In 1832, a second mill was built by others, which "was run on both fine and printing papers, its daily capacity being about 1500 pounds."

Weeks does not tell much more about these mills. Today there are but four paper mills in the State, the oldest of which dates from 1865. One makes boards, the others make bag papers, and the total capacity, according to trade directories, is 105 tons daily, the product of six cylinder machines.

Draper Felts for Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

Canton, Massachusetts

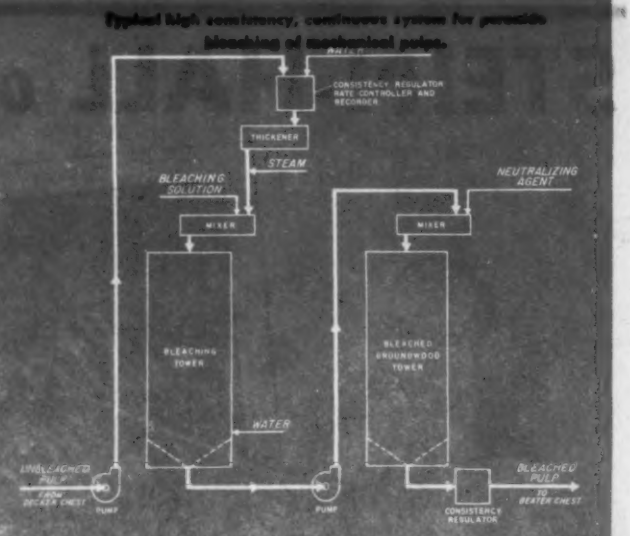
RALPH E. BRIGGS Sales Manager

BRADFORD WEST, PITTSFIELD, MASS. • WILLIAM N. CONNOR Jr, CANTON, MASS. • L. H. BREYFOGLE, KALAMAZOO, MICH. • CHAS. E. BERTSCHY, MILWAUKEE, WIS. • W. L. CAMPBELL, SAVANNAH, GA. • BALFOUR GUTHRIE & CO. Ltd., PACIFIC COAST

NOW!

Groundwood bleached economically with the new

DU PONT PEROXIDE BLEACHING PROCESS



THIS PROCESS is commercially practicable for the bleaching of mechanical pulps made from spruce, poplar, balsam and many other wood species. It is especially useful for preparation of a wide range of improved low-cost papers for book, magazine, catalog, directory, mimeo, tablet, tissue, toweling and other specialty uses.

WHAT THIS NEW BLEACHING PROCESS MEANS TO YOU:

1. More paper from your woodpile! Twice as much bleached groundwood fibre from the wood as from chemical pulping.
2. Savings up to 20 per cent of total fiber cost!
3. Easy to operate, requires less equipment than chemical pulp bleaching systems.
4. Adaptable to large or small plants, using conventional equipment!
5. Higher machine speeds. Pulp handles easily; drains rapidly, has good forming and laying properties.

WRITE FOR MORE DETAILS on the *new* Du Pont Peroxide Bleaching System! Learn how easily it can be set up and operated in your plant. Du Pont Technical Service Men will assist in planning, installing, operating and maintaining such a system to meet your specific requirements. Just write E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington, Delaware.

PAPERS MADE WITH PEROXIDE BLEACHED PULP HAVE—

IMPROVED BRIGHTNESS—substantial amounts of peroxide bleached groundwood can be included in a paper furnish and still maintain good brightness!

GOOD OPACITY—high percentages of bleached groundwood produce highly opaque, bright papers.

BULK—the bulking properties of groundwood are unchanged by the bleaching process!

IMPROVED FORMATION—bleaching "mellows" the pulp, gives better formation on the machine, finer texture, less fuzz and lint!

HIGH CLEANLINESS—fiber bundles and dirt specks are softened and largely removed; equipment is freed from slime growth!

HIGH ABSORBENCY—oil absorbency of bleached pulp is high and rapid; water absorbency and retention are improved!

EXCELLENT PRINTING PROPERTIES—hills and valleys print out uniformly and at lower pressures.

DU PONT
PEROXIDES

DU PONT

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

STEIN-HALL offers counsel...

What are your peacetime problems? Do you need counsel on the best starch method for your starch kitchen . . . on what type starch to use at a particular time or for a particular purpose? Are you studying material and equipment problems? Whatever your problem, Stein-Hall paper men can help you find the answer.

Our paper technical field men know their stuff. They are plant-wise, thoroughly familiar with materials, equipment and production methods. They can tell you the type of starch best suited to your needs, and how to plan an economical, efficient, flexible set-up for maximum results.

Our superior starches, gums and dextrines for sizing, calendering, coating and adhesive uses can be major factors in solving your problems. Call on us for counsel which will help you to secure your share of peacetime business.

79 YEARS OF STARCH SERVICE

STEIN SH HALL

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LABORATORIES AT: NEW YORK
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FOUNDERS—STEIN•HALL RESEARCH FELLOWSHIP AT THE INSTITUTE OF PAPER CHEMISTRY, APPLETON, WIS.

FOR YEAR ROUND SATISFACTION

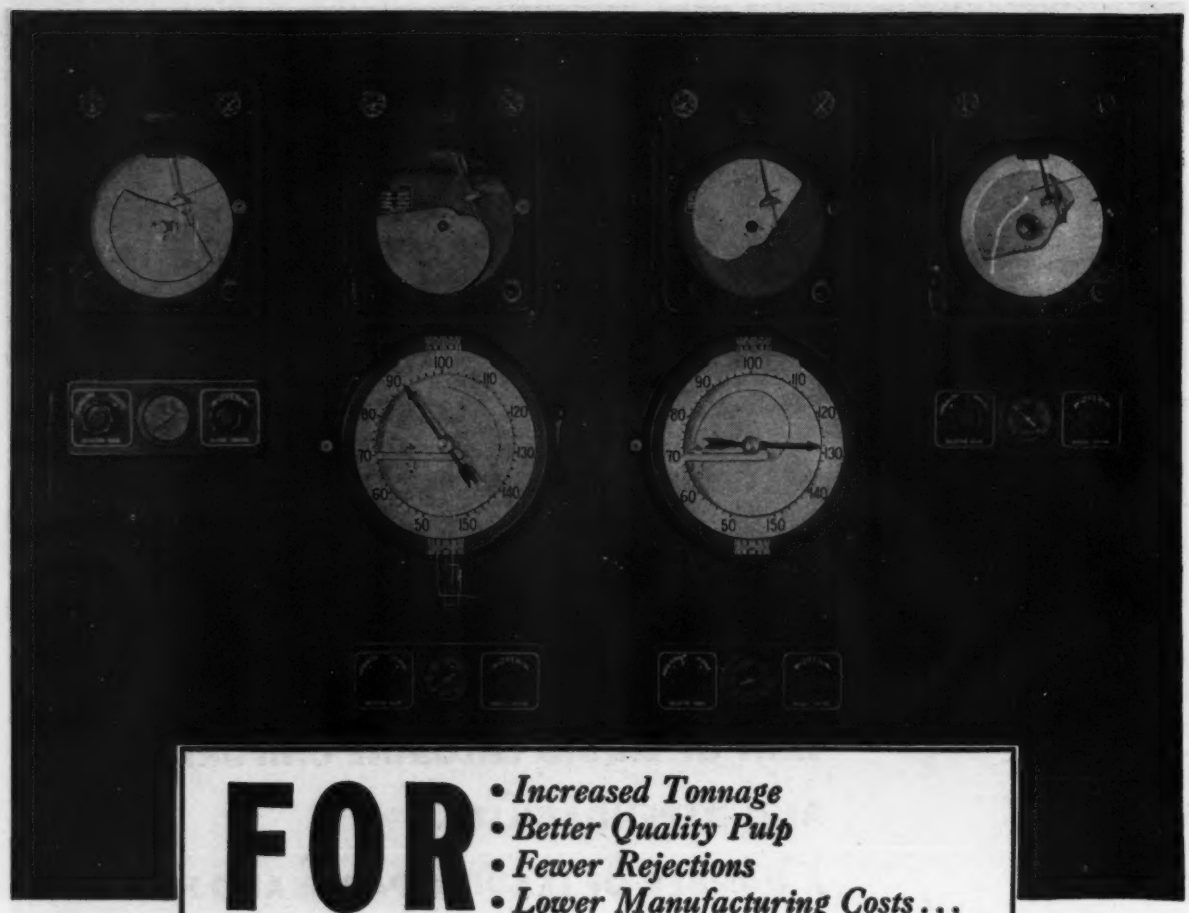
IN YOUR LIQUID CHLORINE PURCHASES, SELECT THE RIGHT BRAND AND A DEPENDABLE SOURCE OF SUPPLY . . . THEN STANDARDIZE.

IT'S THE PROFITABLE WAY TO BE CERTAIN OF LIQUID CHLORINE UNIFORMITY AND DEPENDABILITY.

A NUMBER OF LEADING PAPER AND PULP MANUFACTURERS HAVE SATISFACTORILY STANDARDIZED ON DIAMOND LIQUID CHLORINE,—ALWAYS A TOP QUALITY PRODUCT FOR PAPER PROCESSING OPERATIONS.

DIAMOND ALKALI CO.

PITTSBURGH, PA. AND EVERYWHERE



FOR
- *Increased Tonnage*
- *Better Quality Pulp*
- *Fewer Rejections*
- *Lower Manufacturing Costs . . .*

USE MASONEILAN DIGESTER CONTROLS

Remove as many variables as possible at the Digester and keep those remaining under strict control . . . then you're sure to get uniform pulp at decreased cost.

Masoneilan Digester Controls do just that by taking the guesswork from the cooking process. Once a cycle is determined, these controls will repeat any selected program year after year. Here are the advantages Masoneilan Digester Controls give you —

A UNIFORM PULP — by holding a constant time and pressure schedule and by varying the maximum cooking temperature to compensate for variations in the amount of free SO_2 in the cooking acid.

FEWER REJECTIONS — by controlling the selected and maximum temperature schedule.

UNIFORMITY FROM COOK TO COOK — Masoneilan automatic time cycle controllers consistently repeat and record the pressure and temperature of successive cooks.

LOW STEAM CONSUMPTION — Program controllers prevent over-temperaturing — hence over-cooking. On indirect circulating systems hot condensate is returned to boiler house at considerable saving.

UNIFORM STEAM CONSUMPTION — cycle controllers allow for proper spacing of boiler load.

GAS RECOVERY — time cycle control of relief gas properly proportions it to the recovery process to keep uniform strength in the reclaimed acid.

GREATER PRODUCTION — accurate timing and scheduling of each cook produces greater tonnage.

INCREASED PULP STRENGTH — pop and fold strength increase due to uniformity of the temperature cooking schedule.

DECREASED BLEACHING COSTS — uniformity of pulp decreases the chlorine requirement.

Add your name to our list to receive new bulletin now in preparation

MASON-NEILAN REGULATOR CO.

1180 ADAMS STREET MASONEILAN **BOSTON 24, MASS., U.S.A.**

New York, Philadelphia, Pittsburgh, Toledo, Chicago, Tulsa, Atlanta, St. Louis, Houston, Los Angeles, San Francisco. Mason Regulator Co. of Canada, Ltd., Montreal, Canada

CUT ALL 3 COSTS OF DELIVERING POWER

INITIAL INVESTMENT: Flat Leather Automatic Tension drive costs less — for belt, pivoted base and pulleys — than a comparable complete V-belt drive, except on the smaller sizes. And it costs less to install.

MAINTENANCE: F.L.A.T. drive automatically regulates belt tension, reducing wear on belt and bearings. Savings in belts, parts replacements and man-hours add up to a sizeable total.

COST OF DELIVERED POWER: F.L.A.T. drive is more economical because it delivers more power at rated load than a comparable V-belt drive . . . and its superiority becomes even greater above or below rated load and rated tension.

From the viewpoint of dollars, man-hours, units of production and elimination of down-time loss, the F.L.A.T. drive is the *lowest-priced* on the market!

Ask your Graton & Knight distributor for a demonstration.

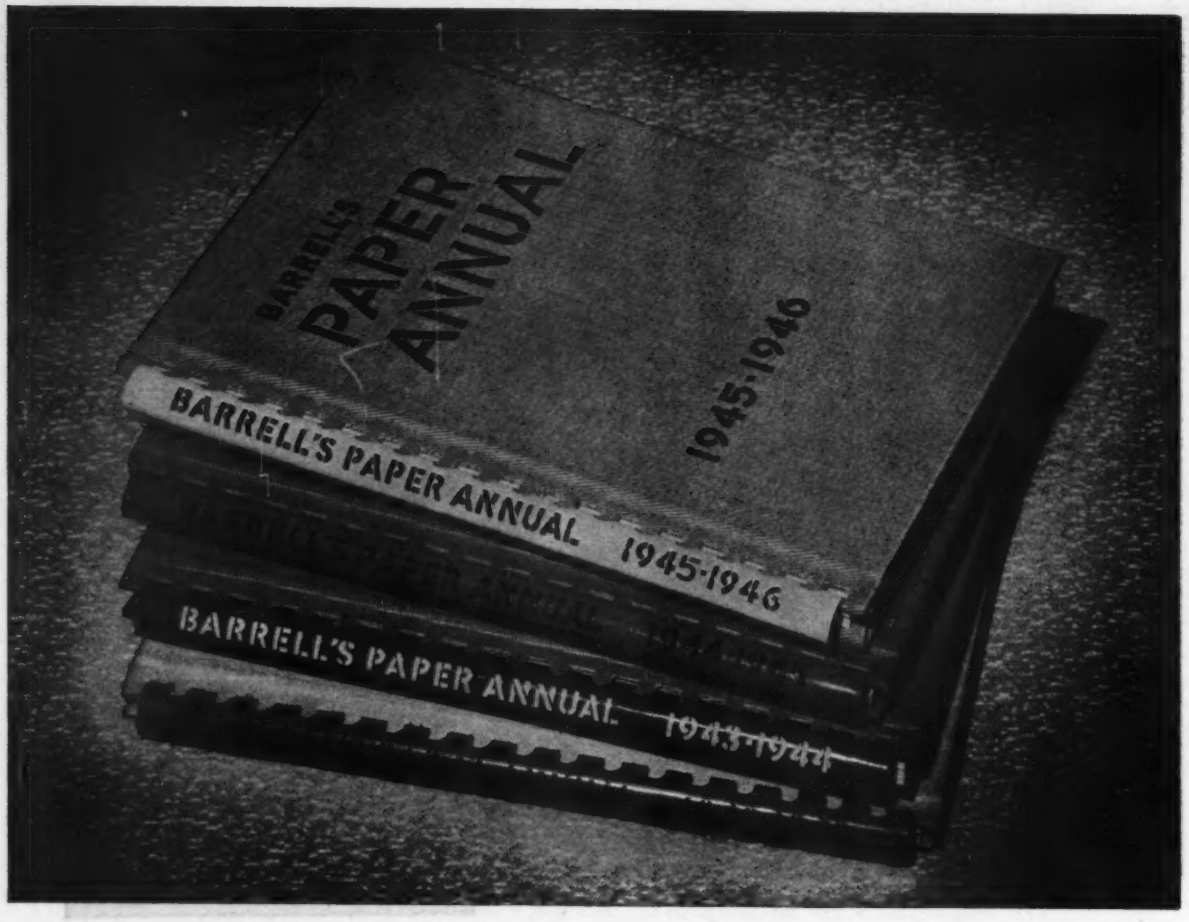
"RESEARCH" LEATHER BELT saves money on a Flat Leather Automatic Tension drive . . . because it has longer life than a rubber V-belt on a comparable drive . . . requires fewer man-hours for maintenance . . . is guaranteed to increase average machine production by at least 3%.

Exclusive "weight-controlled" curry accurately controlling the proper amount of grease to provide pliability and high coefficient of friction . . . pre-stretching according to hide characteristics to remove initial non-elastic stretch and increase tensile strength . . . and patented "Tension-Cementing" — giving the most uniformly high ply adhesion strength ever obtained in belting . . . make "Research" your best buy for dependable and trouble-free service. Write for new, free Belting Manual — to Graton & Knight Company, 337 Franklin Street, Worcester 4, Mass.

GRATON AND KNIGHT

Research Leather Belting

from Graton & Knight's line of leather belting—the most complete for all applications. Graton & Knight distributors are listed under "Graton & Knight" in "Belting" section of Classified Telephone Directory and THOMAS' REGISTER.



Definitely a Perennial

Containing the only illustrated Directory of Paper Industry Associations. If your file is not complete let us know what volume is missing. We will try to replace it.

'SIAMESE TOUR BOSS'

WILLIAM L. BARRELL COMPANY
LAWRENCE, MASSACHUSETTS

SALT CAKE

High quality, free-flowing material available for shipment by rail or water from strategic points located in the East, Middle West, and on the Gulf Coast.

Invaluable To Cost Accounting

Brown Electric Recording and Integrating Flow Meter

In the operation of steam boilers—fuel and water are the raw materials which are converted into the useful product *Steam*.

In practically all cases, the cost of fuel represents the major expenditure therefore its conservation is the primary object of maximum boiler room efficiency.

To operate a steam plant efficiently and properly allocate costs, certain quantities must be measured so that an intelligent analysis of performance can be made.

The importance of Brown's Chart Records can not be over emphasized. They show how much steam is produced and used per fuel dollar expenditure.

The keeping of permanent chart records of temperatures, pressures, flows, liquid levels, etc., is not only considered good management but it is also a modern practice to centralize the measurement of these variables on a main control board. The instruments reveal to the engineer or management any deviation above or below the most efficient operating conditions.

Brown Indicating and Recording Instruments are furnished in standard universal cases, adaptable for any style of panel mounting, they present a uniform and well-balanced appearance.

For information, write THE BROWN INSTRUMENT COMPANY, a division of Minneapolis-Honeywell Regulator Company, 4510 Wayne Avenue, Philadelphia 44, Pa. Offices in all principal cities. Toronto, Canada—London, England—Stockholm, Sweden—Amsterdam, Holland.

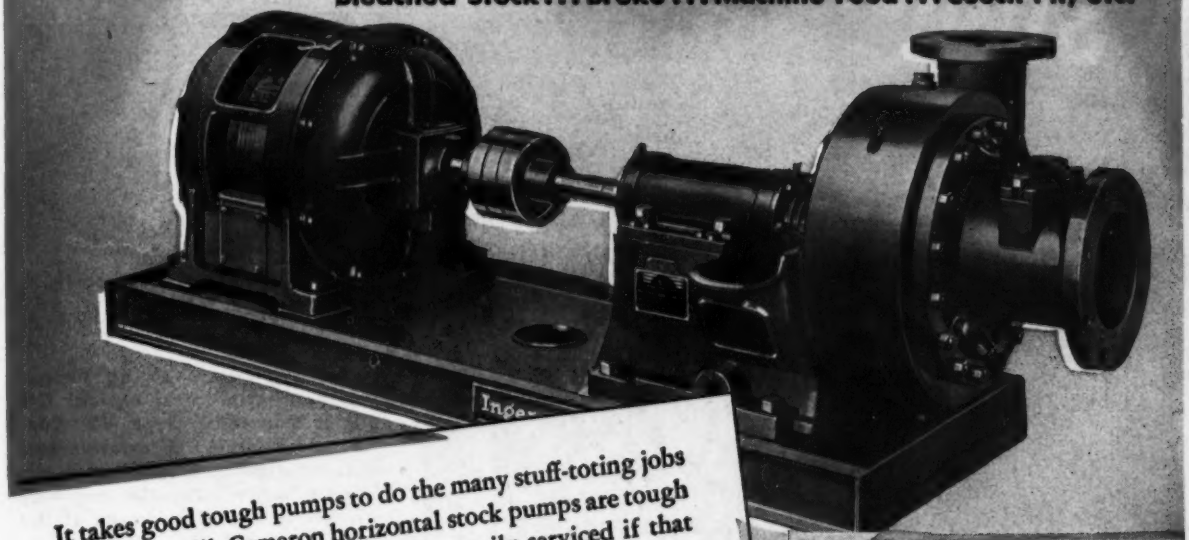
BROWN INSTRUMENTS

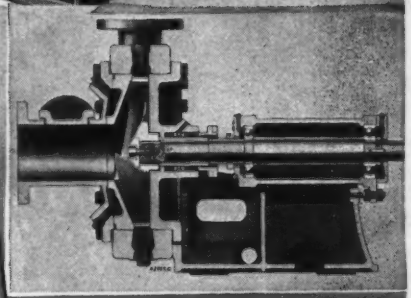
AND MINNEAPOLIS-HONEYWELL CONTROL SYSTEMS

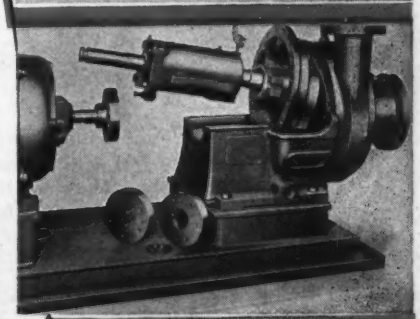
For Temperatures . . . . . Pressures . . . . . Flows . . . . . Liquid Levels

STOCK PUMPS

For Blow Pit . . . Bull Screen . . . Brown Stock . . . High Consistency Deckered Stock . . . Heavy Bleached Stock . . . Broke . . . Machine Feed . . . Couch Pit, etc.







It takes good tough pumps to do the many stuff-toting jobs in a paper mill. Cameron horizontal stock pumps are tough —they stay on the job and they are easily serviced if that becomes necessary.

The casing is heavy . . . it won't crack; it won't corrode through . . . it is good for the life of the pump.

Impellers are straight sided with rounded leading edges . . . This prevents chips from catching between the shroud and impeller vanes.

Adjustment for wear . . . A single easily accessible bolt moves the impeller forward to compensate for wear. The shroud is renewable.

Dismantling is easy . . . The entire rotor and pump backhead may be removed without disturbing the driver or the piping.

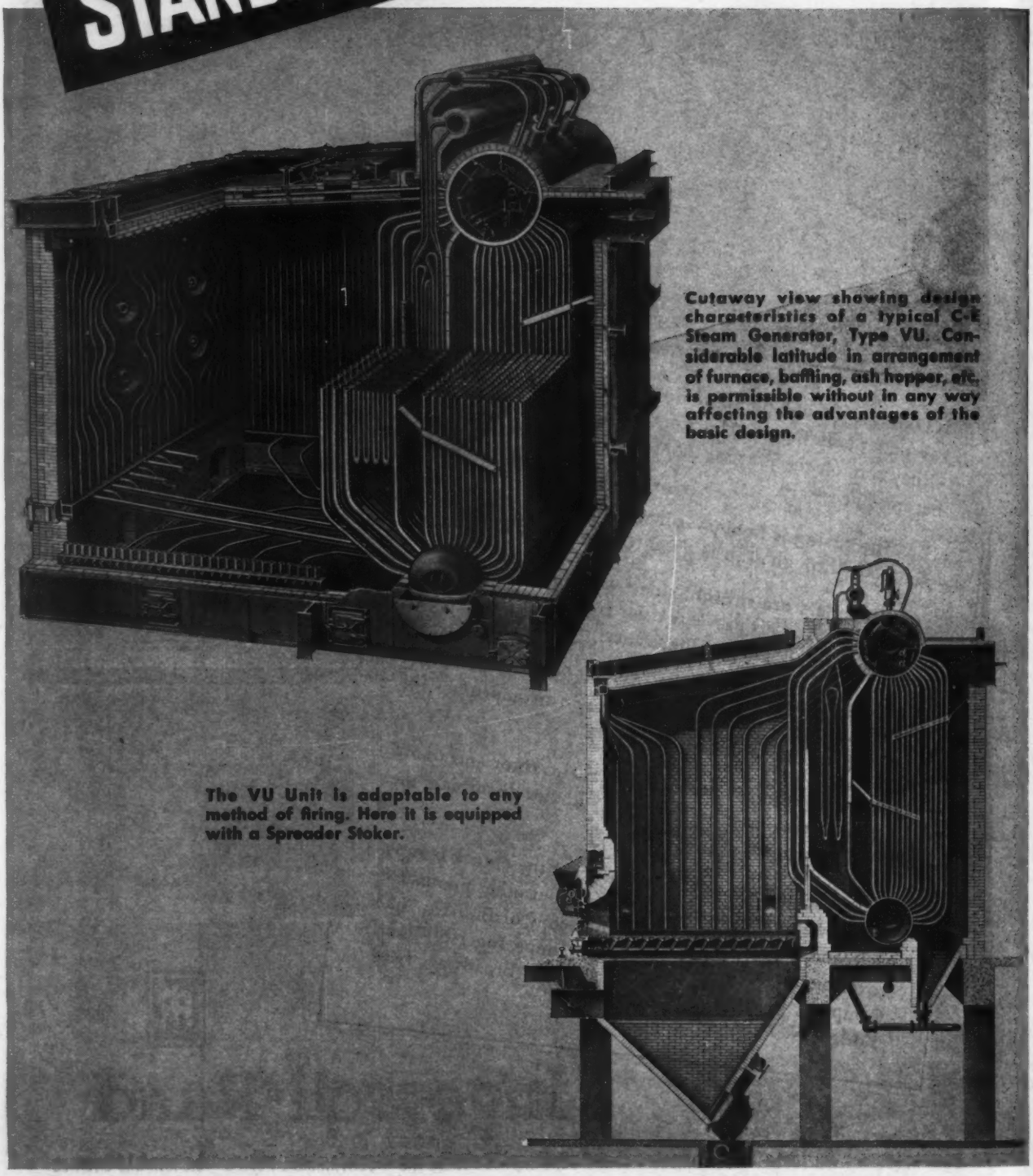
Let an I-R engineer tell you more about these stock pumps, about our vertical stock pumps, or about other pumps for pulp and paper mills. Ask for your copy of Bulletin 7022 covering our complete line of such pumps. Ingersoll-Rand Company, Cameron Pump Division, 11 Broadway, New York 4, N. Y.

Ingersoll-Rand

10-685

COMPRESSORS · AIR TOOLS · ROCK DRILLS · TURBO BLOWERS · CONDENSERS · CENTRIFUGAL PUMPS · OIL AND GAS ENGINES

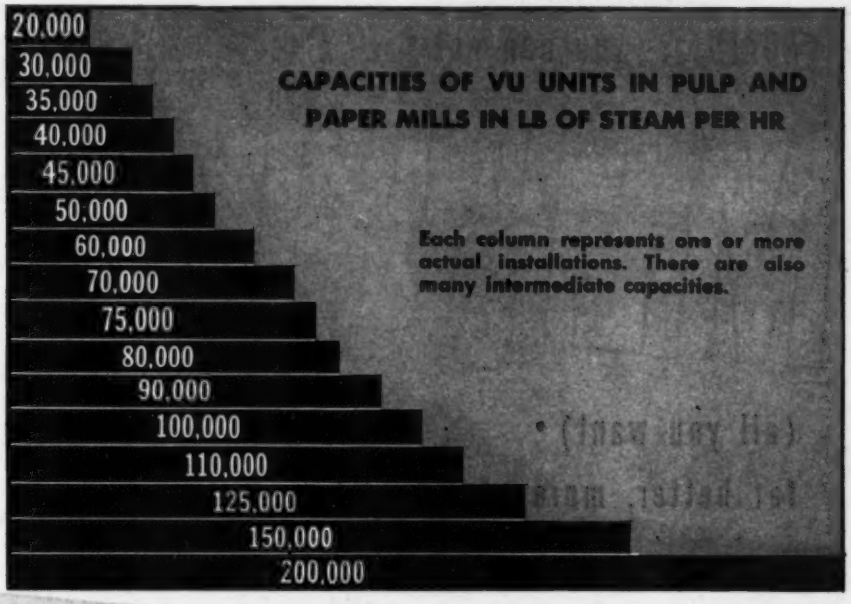
FROM EVERY STANDPOINT The VU



Cutaway view showing design characteristics of a typical C-E Steam Generator, Type VU. Considerable latitude in arrangement of furnace, baffling, ash hopper, etc. is permissible without in any way affecting the advantages of the basic design.

The VU Unit is adaptable to any method of firing. Here it is equipped with a Spreader Stoker.

UNIT MEETS A WIDE RANGE OF PAPER MILL REQUIREMENTS



WHAT, specifically, is meant by a *wide* range of requirements? It includes all the usual items such as capacities, pressures, temperatures, fuels, space limitations and the like. It goes much further — it includes high availability and high efficiency. It extends to such important considerations as the balance between initial investment and long range operating economy.

That Combustion Engineering's VU Steam Generator meets all these requirements exceptionally well is proved by the extent and variety of installations as well as performance records. VU Units have been installed in pulp and paper mills all over the country as well as in Canada and South America. Capacities of these units cover the range shown by the above chart; design pressures are from 150 to 875 psi; steam temperatures range up to 825 F. These installations employ pulverized coal, oil and stoker firing. Some of them are fired by pulverized coal and oil in combination.

The reliability of VU Units is evidenced by plant reports during recent war-time service of which the following is an example from a paper board manufacturer:

> **"This unit does all that we ask of it — always. It works around the clock — 7 days a week for months on end until we shut down the entire plant for scheduled inspection and maintenance of all equipment. We need an average of between 50,000 and 60,000 lb of steam per hour and we're getting it — with never a forced outage."**

Similar reports from other installations are available.

The VU Unit is designed for high efficiency. Actual efficiencies, depending upon fuels and operating conditions, range up to about 88%.

Designed and built to quality standards, VU Units are not sold — or bought — on price when first cost is the paramount consideration. But when a careful analysis of the balance between initial investment and long range operating economy is made, the real reasons for its widespread choice by power engineers become apparent.

A-913

COMBUSTION C·E ENGINEERING

200 MADISON AVENUE NEW YORK 16, N. Y.

C-E PRODUCTS FOR THE PAPER INDUSTRY INCLUDE STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; ALSO MANY TYPES OF PRESSURE VESSELS

AGAIN . . . you can get

MERSIZE

(all you want)

for better, more economical sizing

Once more you can double, triple or even quadruple the efficiency of your sizing by furnishing one part of Mersize* to three parts of rosin at your beaters.

Or you can actually cut the amount of rosin by 50% or more on hard sized papers . . . and get equal results on ink flotation tests and produce a whiter paper that yellows less with age. (Note table of comparisons opposite.)

Mersize contains no wax and eliminates any necessity of using wax. Mersize is supplied as an alkaline water dispersion . . . a viscous liquid containing 50% Mersize Resin. It is easily mixed and stable in storage.

For complete technical information, samples, or assistance in getting Mersize adapted in your mill, write, wire or phone: MONSANTO CHEMICAL COMPANY, Merrimac Division, Everett Station, Boston 49, Mass.

*Reg. U. S. Pat. Off.

MILL SIZING DATA

MILL	TYPE PAPER	% ROSIN	% MERSIZE	% ALUM	TIME OF INK FLOTATION TEST
1.	50% Rag	1.75	—	1.0	25 sec.
	Bond Paper	1.5	.2	1.0	75 sec.
2.	Hard Sized 50% Rag	3.1	—	3.5	22 min.
	Bond Paper	1.5	.5	3.5	35 min.
3.	Sulfite	1.4	—	2.5	30 sec.
	Bond Paper	.7	.35	2.5	54 sec.
		.9	.35	2.5	91 sec.
4.	100% Rag	2.75	—	3.0	2 sec.
	Onionskin Paper	1.33	.67	3.0	11 sec.

Form: Mersize is provided as an alkaline water dispersion. This is a viscous liquid containing 50% Mersize Resin.

MONSANTO CHEMICALS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

Craftsmen in rubber

TABLE ROLLS
WIRE ROLLS
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PRESS ROLLS
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STONITE*

*(Ebonite and Granulated Stone Composite U. S. Patent 1,787,890 Re. 18,111)

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FOR EVERY PAPERMAKING REQUIREMENT

STOWE-WOODWARD, INC.

NEWTON UPPER FALLS 64, MASSACHUSETTS

NEW YORK OFFICE, WOOLWORTH BLDG., NEW YORK 7

STOWE-WOODWARD ROLLS ARE MADE ON THE WEST COAST BY HUNTINGTON RUBBER MILLS, INC., SEATTLE 4, WASHINGTON

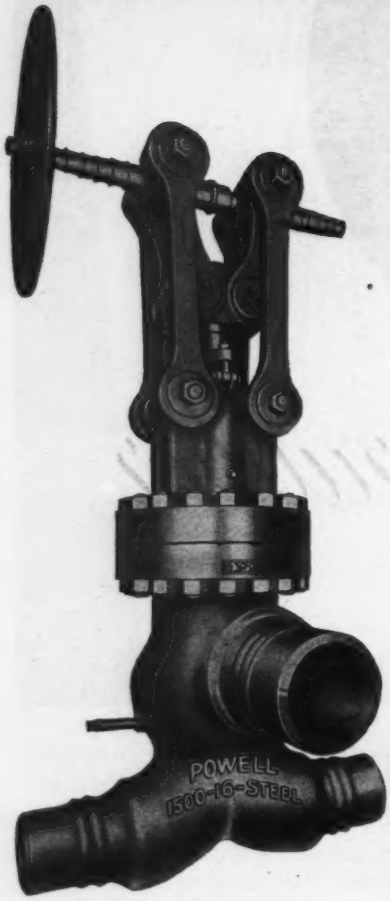
Safeguard your Boiler Installations with POWELL NON-RETURN VALVES

The primary consideration in the design and engineering of all Powell Non-return Valves is to insure the absolutely tight automatic closure so necessary to provide unfailing protection for your boiler installations. Body and bonnet structures are rugged and all parts are machined to perfect tolerances for the temperature limitations of the particular job involved. Chattering or fluctuation of disc level within the valve is reduced to a minimum.

Powell Non-return Valves are provided with thrust bearings or gears. Large sizes may be toggle operated, affording perfect manual control, if required. If desirable, electric motor operators for remote control can be provided.

Today, throughout the country, paper mills operating their own power plants rely on the unfailing performance of Powell Non-return Valves.

The Wm. Powell Company, Cincinnati 22, Ohio



A Powell answer to the demand for higher pressure and higher temperature flow control equipment. This Class 1500-pound Cast Steel Non-return Angle Valve with welding ends, said to be one of the largest of its kind ever built, has 16" outlet and two 12" inlets. Because of special streamline designing the pressure drop through the valve is reduced to the minimum. Valve is toggle operated.

(Right) Class 1500-pound, 14" Welding End Cast Steel Non-return Angle Valve. Specially designed to satisfy certain specific requirements. Valve is toggle operated.

Class 900-pound, Flanged End Cast Steel Non-return Globe Valve. Spur Gear operated.

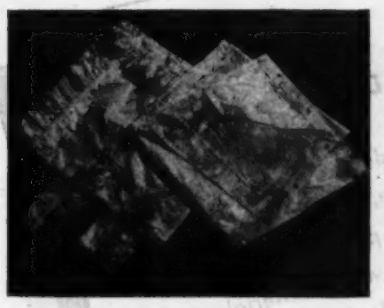
(Right) Class 900-pound, 10" Welding End Cast Steel Non-return Angle Valve. Spur Gear operated.

POWELL VALVES

● COATED PAPER

● COATED CORD

● RAINWEAR

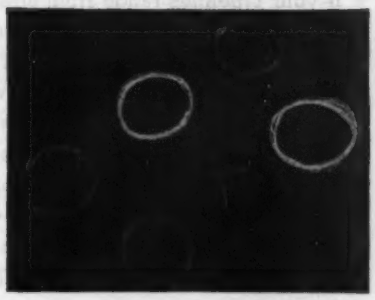


● SHOWER AND WINDOW CURTAINS

● WIRE INSULATION

● COATED FABRIC

These are typical applications for Geon Latex



● COATED SILK AND NYLON THREAD

Water-borne polyvinyl resins provide safer, simpler processing methods

These finished products indicate the variety of articles that can be made using GEON latex as one of the basic raw materials. For example, thin coatings of GEON latex can be applied to fabric, leather, paper, fibre, thread, wire, or any other material to which coatings can be applied by conventional methods.

Suitably formulated, GEON latex—a water dispersion containing approximately 50% vinyl resin—can be used on standard processing equipment. Being a water system, GEON latex offers many advantages not to be found in solvent systems—simplicity and economy of processing—no danger of toxic vapors, or explosion—elimination of expensive, cumbersome solvent recovery systems. Highly stable, GEON latex is *not* rubber and contains no rubber.

GEON latex is not a "miracle material" that will do away with other coating methods. Yet already there is evidence that it will open entire new fields in the manufacture of coatings, sheet, and film. For more information write Dept. MM-12, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

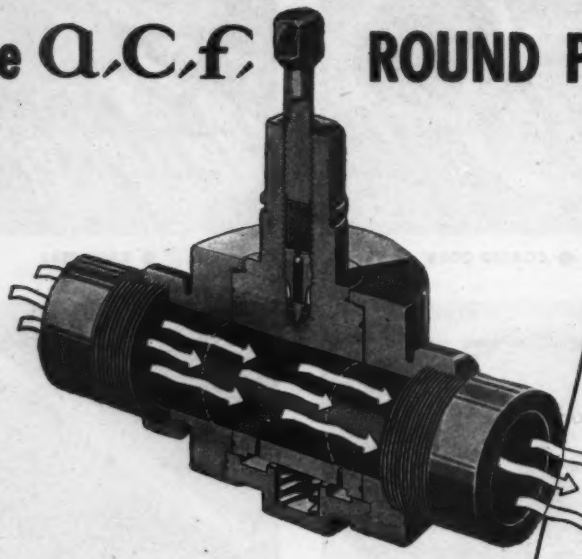
Geon
Polyvinyl Materials

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

Don't Let Valves Retard Your Pipe Line Flow!

Use A.C.F. ROUND PORT Valves (½" to 8")



SOLVES LADING PROBLEMS

Tar, sludge, grouting, asphalt, viscose, rayon, nylon, granular solids, paints and similar viscous or waste materials are all handled efficiently — as are paper pulp, pulp while in process, black liquor, white liquor, caustics, acids. Send for Catalog No. 3-T.

If your pipelines range from size ½" to 8", you should see that your valves do not impede free flow . . . an A.C.F. ROUND PORT Full Pipe-Area Lubricated Plug Valve can provide real help! When open, the valve becomes an exact continuation of the pipe — there is no change in lading velocity, area, direction or cross-section, thus reducing pumping and power costs. The A.C.F. ROUND PORT Valve has no crevices in which the lading may lodge or deposit.

In addition to full, unrestricted pipe area, A.C.F. ROUND PORT Valves, with Straight Through Plugs, provide the following noteworthy advantages:

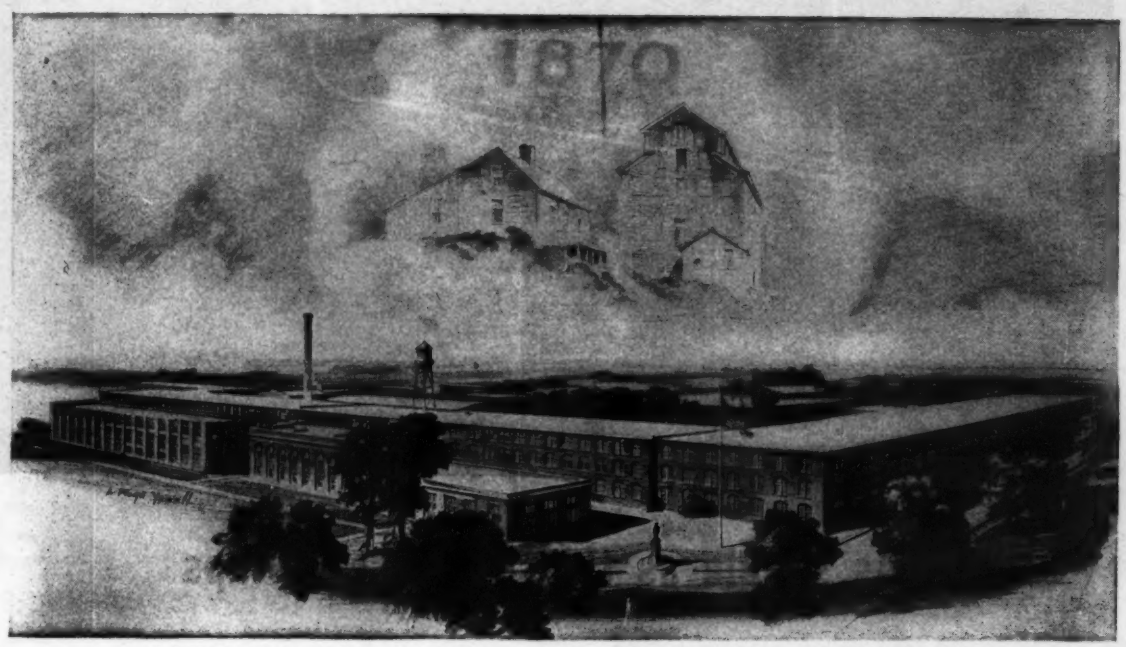
- *Tightness against head leaks under any line pressure.*
- *Perfect lubrication against wear and abrasion.*
- *Least number of parts.*
- *No exposed seating surface.*
- *Quick opening.*
- *Installation in any position.*
- *Compactness for "close quarter" installations.*
- *Minimum corrosion.*
- *Ease of operation and dismantling.*

A.C.F. Lubricated Plug Valves will efficiently handle all processing and industrial plant ladings. Representatives in principal cities carry adequate warehouse stock for quick delivery.

AMERICAN CAR AND FOUNDRY COMPANY

Valve Department
30 Church Street, New York 8, N. Y.

75 Years of Paper Progress



KENWOOD MILLS • 75th ANNIVERSARY • 1870-1945

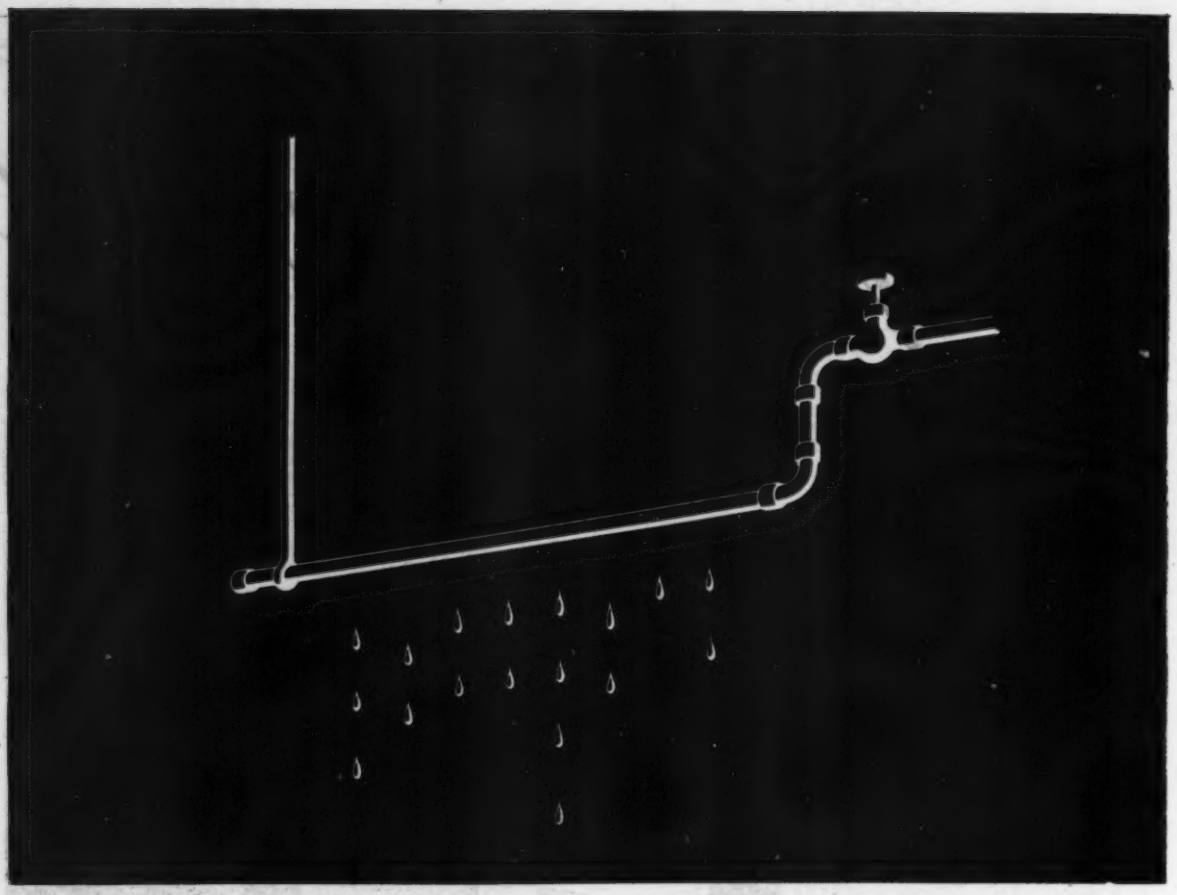
Seventy-five years ago, the American paper industry was just beginning its great period of expansion. Since then paper, at lowering costs and in increasing volume, has changed the course and character of civilization, spreading culture and education, stimulating business, elevating the standard of living. The progress of the paper industry has paced the progress of America.

Also, just 75 years ago, F. C. Huyck & Sons began the manufacture of fine quality papermakers' felts. Recognizing that in wartime and peacetime every paper problem is a felt problem, this organization has pioneered in research and in service, working always in the closest cooperation with the paper industry.

As the world's largest manufacturer of papermakers' felts, F. C. Huyck & Sons, in observing its 75th Anniversary, salutes the paper industry for its magnificent contribution to the winning of the war, and looks forward to a continuation of the policy it has so long pursued, seeking new and better ways to help produce more and better paper—the product most used by man.

KENWOOD WOOL PRODUCTS

F.C.HUYCK & SONS · *Kenwood Mills* · ALBANY, N.Y.



As simple as this to preserve laps

All that is required to preserve laps in the average pulp mill is a gadget like that shown above: a perforated pipe, a control valve and a suspended tank to gravity-feed a solution of "Lignasan" on the sheets as they pass over the wet machine.

"Lignasan" contains *ethyl mercury phosphate,* one of the most powerful fungicides and bactericides known. It is extremely effective even in low concentrations against slime-producing bacteria, as well as fungi that cause pulp to rot. As little as 3 to 5 ounces per ton of fiber, dry basis, is usually sufficient to prevent growth of profit-stealing slime on the paper machine.

Added at the beater in powder form, "Lignasan" may be generally counted on to control slime throughout the entire "wet" paper making processes. Or, it may easily be fed in solution as a spot treatment into the system at any point where slime habitually occurs.

Protect stored laps and slush pulp too, with "Lignasan." From 4 to 8 ounces per ton of fiber, dry basis, offer protection against spoilage.

Get the facts today on how "Lignasan" can help increase production and cut costs in *your* mill. Write our nearest office or E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

Controls slime
Preserves pulp

Du Pont Lignasan
REG. U.S. PAT. OFF.
BACTERICIDE AND FUNGICIDE

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

The Biggs BOILER WORKS CO. AKRON OHIO U.S.A. EST. 1887

Biggs Digesters . . .

STANDARD EQUIPMENT FOR OVER 50 YEARS

Fig. 1—Biggs 14 ft. dia. welded rotary digester with worm-and-segment drive. *Fig. 2*—nine 14 ft. x 40 ft. sulphite digesters; weight, 65 tons each.

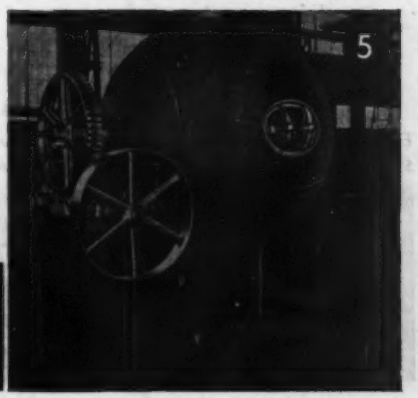
Fig. 3—cylinder rotary bleaching boilers available in all sizes and with various types of drives.

SINCE 1887 Biggs globe and cylinder rotary as well as stationary digesters have been universally used in the paper industry. These units are furnished in all sizes; are made from carbon or alloy steels for various working pressures with drives, linings and fittings to suit individual processes. Biggs "rotary boilers" are most versatile and economical in cooking, bleaching and otherwise processing a wide range of materials for standard and special operations. Units installed by Biggs in 1890 are still in daily operation with a minimum of maintenance. Biggs maintains a competent erecting organization. *Write for Bulletin 45.*

Biggs' modern plant facilities permit the fabrication of pressure vessels, welded tanks, pipe lines, stacks qnd other types of plate work.

Fig. 4—laboratory digester 8" x 18" with chain drive; working pressure, 250 lbs. Can be had in various sizes.

Fig. 5—experimental rotary digester made of nickel-clad steel. Units available in sizes from 30" to 72" dia. for various working pressures; fittings as required. →



BIGGS-WELD — STRONGER THAN THE PLATE ITSELF

THE Biggs BOILER WORKS CO.

1012 BANK STREET · AKRON 5, OHIO, U.S.A.

"Dependably strong"

means KLEENEX

—and only Kleenex has the Serv-a-Tissue Box

60 years' experience in making ADHESIVES THAT WORK

Kleenex Tissues rank high among the most popular household items in millions of American homes. And the convenient, attractive Serv-a-Tissue carton is one of the strong reasons why tissue users prefer the Kleenex brand.

The makers of Kleenex tell us, "For many years, Arabol Adhesives have been successfully used in the sealing of our cartons. Rarely, if ever, does a customer have any cause for complaint on the performance of the package. Equally rare are any cases of spoilage and rejection. That's mighty important at any time. It's *remarkable* — under today's conditions of round-the-clock operation."

It is Arabol's aim always to supply the one most efficient adhesive for each particular need. Out of our long service to a hundred industries, there are now 10,000 adhesives formulas in the Arabol Laboratories. Your Arabol Representative knows adhesives; see him when he calls.

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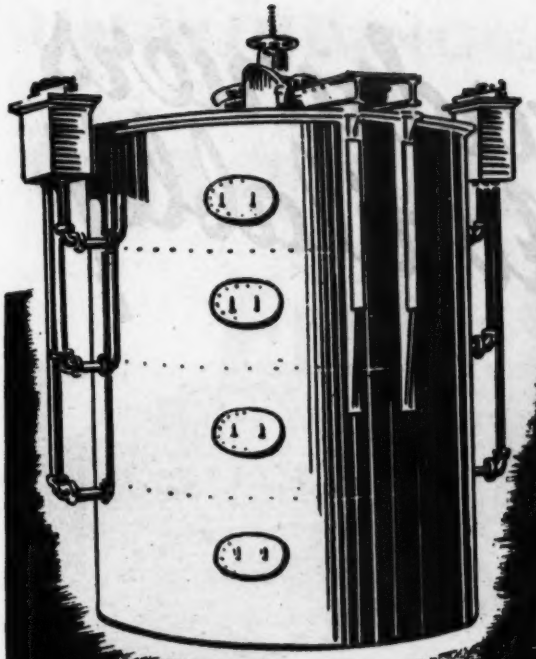
Adhesives? . . . ARABOL!

SIXTY YEARS OF PIONEERING



a NEW dual-purpose Lime Mud Washer

The new Dorr Two-Stage Mud Washer consists of a standard four-compartment Balanced Tray Thickener with the second tray sealed so that the upper two compartments operate in *parallel* with each other, the lower two compartments also in *parallel,* but with the upper set in *series* with the lower pair.

How It Works

The feed box divides the feed two ways or four ways. The overflow box is similarly designed to operate in the conventional manner of a four-compartment Balanced Tray Thickener, or to keep the overflow from the upper two compartments separate from the lower two. *Thus, the Tray Thickener can be operated as a standard four-compartment Balanced Tray Thickener Unit or as two separate two-compartment Balanced Tray Thickeners in series.* A Dorrco Suction Pump is used to remove the sludge from the bottom of each pair of trays.

Advantages

The Two-Stage Mud Washer thus provides an additional stage of washing at no extra initial expense except the cost of two pumps. Furthermore, the need for a spare filter is not as great; the overflow from the second stage is low enough in soda-content to permit sending it directly to the lime kiln during emergency service.

The Two-Stage Mud Washer provides this extra mud-washing stage while at the same time presenting a design which permits the Lime Mud Washer to be used as a white liquor Clarifier at full capacity during emergencies. During such operation the sludge is removed from the second and fourth compartments.

For further information on the Two-Stage Mud Washer or on Balanced Tray Thickeners, write to your nearest Dorr office.

DORR

RESEARCH ENGINEERING EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

8092

DORRCO

THE DORR COMPANY, ENGINEERS

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WESTPORT, CONN.

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PETREE & DORR DIVISION
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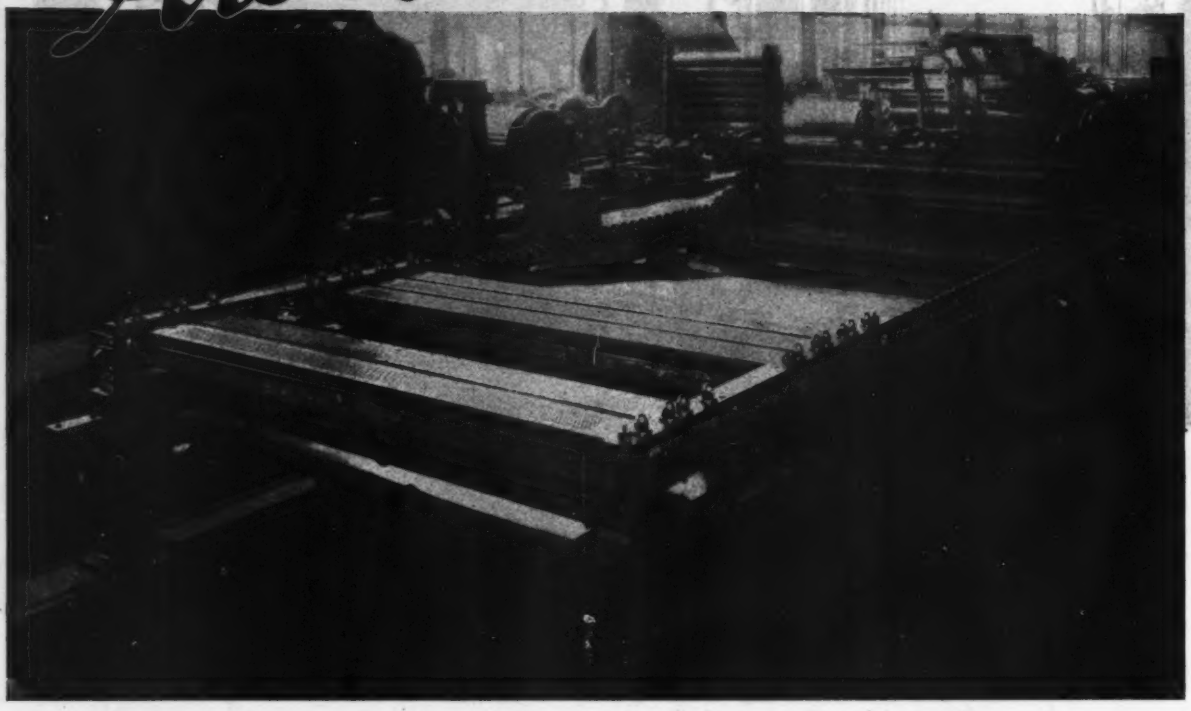
Simplex Fourdriniers Are Now Available!



The photograph above shows one of the first Simplex Fourdriniers completed on the erecting floor of the Bagley and Sewall Company since the end of the war. The Fourdrinier is approximately 100" wide and is of the Non-Quick Wire Change type. It is mounted on micarta springs, and the shake arrangement consists of two Simplex Shake units. The save-alls, the suction boxes and all exposed parts are made of non-corrosive material.

As with all Bagley and Sewall paper making machines or piece of equipment, this Simplex Fourdrinier was fully erected and all working parts tested before shipment to insure perfect operation after installation in the paper mill.

- Bagley and Sewall Products -

Paper Making Machines
Spiral Bevel and Hypoid Gear Drives
Simplex Fourdriniers and Shakes
Harper Fourdriniers - Cylinder Moulds
High Speed Reels and Winders
Harmon Diaphragm Screens

THE BAGLEY & SEWALL CO.
WATERTOWN, NEW YORK
Builders of
Paper Machines
and
Paper Making Equipment

BAGLEY B&S SEWALL

UN-WINDING AND RE-WINDING

Change Rolls at Full Speed!

ELIMINATE DOWN TIME . . . *keep your quality constant, reduce tonnage cost decrease loss and waste!*

THE KOHLER SYSTEM COMPANY
CHICAGO ILLINOIS

The Kohler System

of continuous un-winding and re-winding permits

FULL SPEED CHANGE OF ROLLS

on super calenders, coaters and in all converting operations

The Kohler System Co.

159 S. CHICAGO AVENUE
CHICAGO 11, ILLINOIS

Have You Investigated the Economies of Unsettled Bleach Liquor

ARMY E NAVY

ARE YOU prepared to meet the new demands for increased brightness of your papers—and do it at a reasonable cost? The use of unsettled bleach liquor is showing the way in many mills to new economies in bleaching, through the elimination of long settling periods, sludge washing, large storage facilities and high labor costs.

The pros and cons of unsettled bleach liquor are summarized in Hooker Bulletin 242. This Bulletin together with Bulletin 201 clearly presents the economies of its use, the operating procedure, required equipment and the approximate costs for the installation. Copies of both these Bulletins will be sent you free when requested on your letterhead. Members of Hooker's Technical staff, who have been instrumental in many of the advances in the pulp and paper industry are ready to advise and work with you in bringing your peacetime plans to realization.

BULLETIN 242

BULLETIN 201

HOOKER ELECTROCHEMICAL COMPANY

6 Union St. Niagara Falls, N. Y.

New York, N. Y. • Wilmington, Calif. • Tacoma, Wash.

HOOKER CHEMICALS

Caustic Soda Chlorine Muriatic Acid
Sodium Sulfide Bleaching Powder

8437

Reg. U. S. Patent Office

Doc Steelstrap is back from the war! *Now your individual needs come first!* To the thousands of manufacturers for whom Doc Steelstrap is a symbol of friendly, efficient service, this is good news.

Doc is again available to prescribe Acme methods of package reinforcement and bracing of carload shipments — to effect lower distribution costs and assure maximum product protection. Write or call any office.

New York 17 Atlanta Chicago 8
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ACME STEEL COMPANY

ACME STEEL CO. CHICAGO

PAPER · · · America's 6th Industry

PAPER PLATES FOR FROZEN FOODS

(NEWS ITEM: *Individual dinners, frozen on paper plates, will soon be on sale in neighborhood grocery stores.*)

The housewife's dream of "no more cooking, no more dishwashing" may soon be realized. Individual dinners, quick-frozen on sturdy processed-paper plates, have been in military service until now. Before long they will appear in grocery stores. The dinner—plate and all—is heated for 15 minutes before serving.

Paper for shipping sacks . . . Paper for draperies . . . Paper for rug backing yarns . . . Paper for baking dishes . . . New uses for paper, calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

The Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines.

The Puseyjones Research and Development Committee, formed within this Organization to help in our service to America at War, now shares with the Paper Industry many of the lessons learned in the use of new materials and new techniques—and which are now so co-ordinated as to be of practical, workable value.

Our engineers are on call to survey your requirements.

A New Bulletin—"The Improved Puseyjones Steam Joint" is now available. Also a descriptive pamphlet on the improved Stream Flow Vat System . . . Yours on request.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

Vol. 121, No. 21

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

November 22, 1945

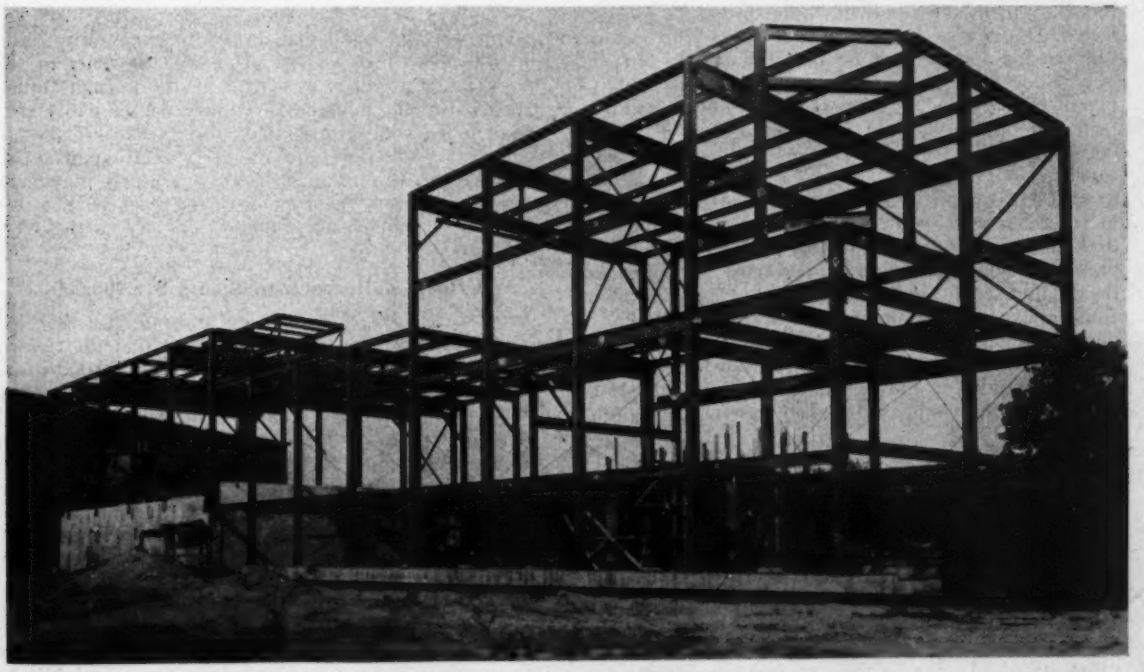
Paper Mills Plan to Spend Over $150,000,000 For New Plants and Equipment

By Stillman Taylor, Association Editor, PAPER TRADE JOURNAL

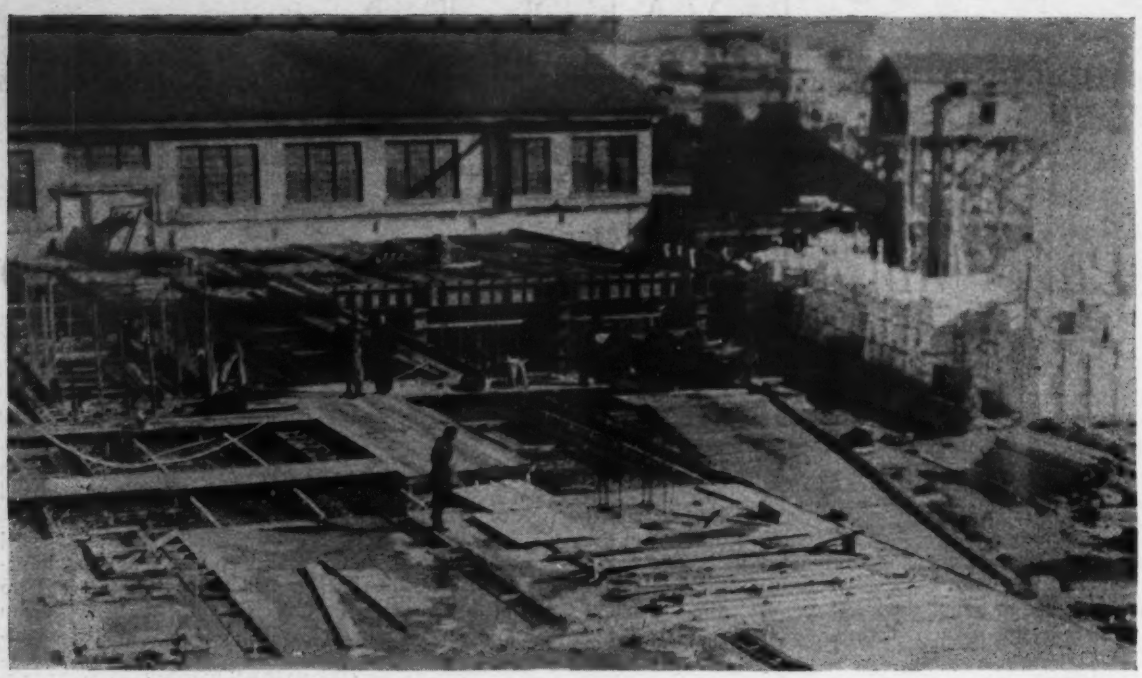
For more than half a century the trend in the production of paper in the United States has been consistently upward. This steady expansion is equalled by very few major industries. Its expansion lies in the essential nature, the wide utility and the comparatively inexpensive cost to the consumer of the large and varied line of paper products. As very little expansion could be undertaken during the war years, a large pent-up building and modernization need has accumulated.

In a recent report the Department of Commerce stated that capital expenditures throughout the industry will be large, resulting in considerable construction and a large demand for machinery and equipment. The estimate by the same source in June indicated that the paper and allied products industries and the printing and publishing industries anticipated capital outlays in the twelve months after the termination of the war of about $530,000,000, compared with $136,000,000 in 1939. Reconversion forecasts released November 15, 1945 by the Civilian Production Administration for paper and pulp mill machinery, based on industry estimates contained the following interesting forecasts, in per cent of first quarter 1945 monthly average: Actual, September, 1945, civilian shipments, 115.3; employment, 78.4. Estimated manufacturers' forecast for October, 1945, 134.4, employment, 78.9; December, 1945, civilian shipments, 163.7, employment 80.4. June, 1946, civilian shipments, 226.5, employment, 89.6. June, 1946, as per cent of 1939 monthly average, civilian shipments, 280.4, employment, 206.8. This data indicates that the principal reconversion industries will be producing in June, 1946, at a rate of two and one-half times greater than in 1939.

In commenting on new capacity in the paper indus-



Construction work progresses in $4,000,000 expansion program at St. Regis Paper Company's Deferiet, New York, pulp and paper mill. This view of the new groundwood mill building, looking northwestward, shows erection of structural steel. Work of enclosing the structure is nearing completion. New mill facilities will permit annual increase of 30,000 tons of the new St. Regis bleached groundwood periodical magazine and printing papers.



Work is well under way at the Westminster plant in New Westminster, B. C.

try, the September Monthly Statistical Summary of the American Paper and Pulp Association stated: With practically all new construction discontinued from 1942 on, the removal effective October 15, of the limitations controlling construction will result in a considerable budget of new construction in this growing industry. In an attempt to gauge the extent of this movement the following published data are collected. D. Stevens Wilson in a widely quoted article "Planned Capital Outlays and Financing," in the July Survey of Current Business lists the outlays planned by producers of paper and allied products, printing, publishing and allied industries at $690,000,000 during the next twelve months. This total was broken down into plant equipment and alterations, $530,000,000, increased inventories, $80,000,000, and increased receivables, $80,000,000. Mr. Wilson has broken down for us (the A.P.P.A.) the data to present the pulp, paper and paperboard component of these figures. The indicated expenditures total about four times the 1939 amount. The census of 1939 reported capital expenditures by this industry of $37,501,951, which would indicate, according to Mr. Wilson's study, capital expenditures of about $150,000,000 in this industry during the twelve months after July, 1945.

A tabulation by the staff of the American Paper and Pulp Association of the announcements up to October 11, 1945, in the trade papers gives the following: pulp mills, $10,750,000; integrated paper mills, $55,500,000; non-integrated paper mills, $23,695,000; paperboard mills, $22,552,000; converters, $1,446,000, making a total of $113,943,000. These figures include a few Canadian pulp mills but a number of the larger projects mentioned in the trade papers had no dollar value stated. As far as they go and considering the probability of omissions they tend to confirm the Wilson estimate of $150,000,000. Other estimates as high as $200,000,000 are made by various authorities but without giving sufficient information for comparative purposes. Taking the Wilson estimate of $150,000,000 as coming from official sources and as probably the most accurate, it indicates a new capital investment equal to about 5% of the total assets of the industry. This is not sufficient to accomplish much more than to replace the normal depreciation of equipment that has taken place in the industry during the last two years. Even allowing that equipment has been maintained and that the entire expenditure is to be applied to increase the productive capacity of the industry, it would represent about the normal annual growth for the industry as a whole. If the entire sum were to be concentrated upon one sector of the industry it might develop dangerous over-expansion in that sector. As present indications are that it is to be widely scattered, the conclusion is reached that this expansion sohuld not create difficulty with overcapacity.

Crown Zellerbach to Spend $15,000,000

One of the largest expansion programs yet revealed for one concern is the announcement that the Crown Zellerbach Corporation will expend $15,000,000 in its pulp and paper plants during the next few years. The sulphate pulp mill at Camas, Wash., will be increased to nearly twice its present capacity and a modern sulphate bleaching plant installed; the first bleached sulphate pulp equipment to be installed in any of the corporation's plants. The bleached pulp produced in this new unit will be used to improve the quality of paper produced at Camas and to supply a new paper machine of the most modern design to permit production of some additional grades of top quality specialty papers. A new paper machine will also be installed at Camas to produce facial tissue. Construction work on the corporation's Port Townsend, Wash. kraft mill began this spring, where a complete new kraft chemical recovery unit was authorized by the War Production Board. Here the first hydraulic log barker was developed and installed. A new drum

The BIRD SCREEN

Performs Not One But *Three*

Vital Papermaking Functions For You

First, it takes out the dirt just ahead of the paper machine, guarding against expensive injuries to the machine wire as well as assuring uniformly clean paper.

Second, it makes possible continuously good sheet formation at maximum machine speed. Fibres are thoroughly combed out and individualized.

Third, it eliminates lumps, strings and slime—delivers stock that is uniform in weight.

Screening is too important to permit anything but the best, modern Screens of ample capacity for most efficient screening action. Check with Bird Machine Company, South Walpole, Massachusetts, if there is any question about it.

85% OF ALL THE PAPER MADE IN NORTH AMERICA PASSES THROUGH BIRD SCREENS

barker will also be installed there. A modern hydraulic barker will also be installed at the newsprint mill at Port Angeles, Wash.

Champion to Spend over $7,000,000

The Champion Paper and Fibre Company has announced plans for expansion of facilities to cost between $7,000,000 and $8,000,000. The contemplated improvement include a new Fourdrinier paper machine at the Canton, N. C. mill, expansion and improvements in bleaching and reclaiming facilities at the Houston, Tex. and Canton mills. Other improvements will include the conversion of the sulphite pulp process to the bleached sulphate process, and additional power facilities at Canton, also the acpuisition of additional timber lands, the possible shifting of certain papermaking facilities between mills, and many other improvements. These additions are expected to increase the company's pulp production capacity about 50 tons daily and increase paper and paperboard production approximately 120 tons daily.

Minnesota Co. to Expand $6,000,000

Expansion plans of The Minnesota Mining and Manufacturing Company, St. Paul, Minn., include an additional 400,000 square feet of space to the "Scotch tape" plant in St. Paul. A plant to manufacture roofing materials will be built in the South. At International Falls the company plans a new Insulite machine which will increase capacity 40%, a new research laboratory, addtional equipment for grinding wood and manufacturing paper, a new plant for bleaching 100 tons of kraft paper daily, a new plant for bleaching 75 tons of groundwood daily, a new plant for filtration of water, mechanical equipment to insure maximum utilization of byproducts; additional structures for housing Mando employees, additional machines for preparing and grinding pulpwood and production of papers, and extensive modernization of miscellaneous equipment and installation of new machinery.

Kalamazoo Parchment to Spend $8,000,000

Total expenditures of $8,000,000 will be made in carrying out the expansion plans of the Kalamazoo Vegetable Parchment Company. The company acquired the former Abitibi Power and Paper Company property at Espanola, Ont., Canada. Demolition and construction work was started last year to adapt it to the new requirements. Approximately $5,000,000 will be invested in building and equipment for a 200-ton bleached sulphate mill, complete with wood room, boiler house and water filtration plant. Existing buildings will accommodate screens and bleaching operations.

St. Regis Starts $4,000,000 Expansion

The St. Regis Paper Company has started its $4,000,000 expansion program at the Deferiet, N. Y. pulp and paper mill, to increase the company's output of super calendered, machine finish and machine coated groundwood papers. The WPB approved early in the year the installation of a high speed 218-inch Fourdrinier paper machine; expansion for bleached sulphite and bleached groundwood pulp; the installation of a battery of the latest type grinders; construction of a new power plant and electrical distribution system and the building of a new bleaching plant. The Deferiet mill's new No. 6 paper machine, the giant Fourdrinier formerly operated at Algonquin Paper Company's Ogdensburg, N. Y. plant, will be partially rebuilt for installation in a new building now under construction. Integrated with Deferiet groundwood and sulphite pulp production, the machine will be designed to operate up to 1200 feet per minute and produce 104 tons of paper daily. The machine includes an 80 feet long Fourdrinier wire section and thirty-four 212 inch wide by 48 inch diameter dryers. A $2,000,000 expansion program has been started at the Trenton, N. J. plant of the Panelyte Division of the St. Regis Paper Company. This expansion has become necessary to meet the increasing demand and quick deliveries of Panelyte molded and fabricated parts used by the refrigerator industry.

Kimberly-Clark to Spend $5,000,000

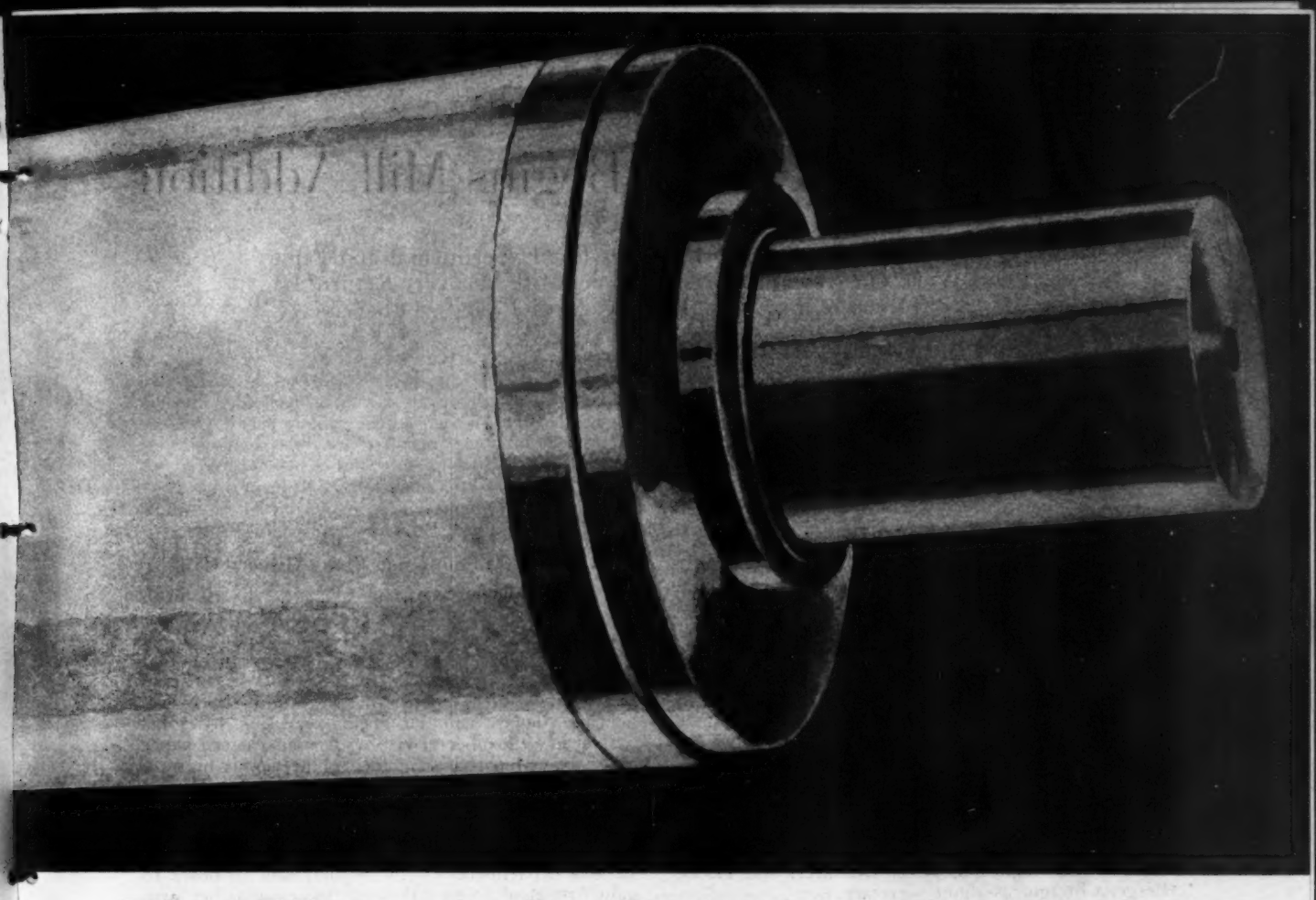
The Kimberly-Clark Corporation have started an expansion and modernization program at its Quinnesec mill at Niagara, Wis. This project will be the initial step in a substantial increase in the corporation's book paper production. This is the largest expansion program undertaken by the corporation since 1920. It will include a new building to be erected adjoining the present mill, 600 feet long and wide enough to accommodate two high speed Fourdrinier machines. One of the machines will be installed immediately and the entire expansion work is expected to be completed in 1947.

Hammermill to Spend $5,000,000

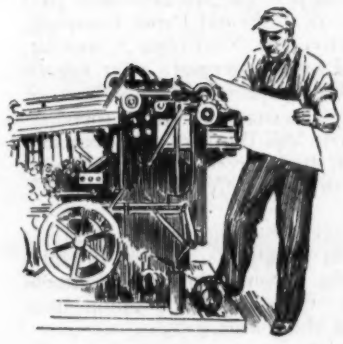
Expansion of facilities in the installation of new equipment by the Hammermill Paper Company, and additional improved processes, is expected to result in a substantial increase in the company's plans to reemploy veterans of the war. Among the improvements will be two 150,000 pound high pressure boilers and a new turbine to produce power at a minimum of cost. Ground has been broken for a 600 by 225 feet warehouse for the storage of finished products. Expansion will also include the installation of a new, larger and faster papermaking machine, surpassing any of Hammermill's present six papermaking machines now in operation.

Chemical Society Meets at Trenton

TRENTON, N. J., November 20, 1945—The Trenton Chemical Society held its fifth meeting Tuesday evening, November 6th, at Kelly's Restaurant on South Broad Street. Forty-five chemists from Trenton and vicinity gathered to hear Dr. G. B. L. Smith of Polytechnic Institute of Brooklyn speak on "Non-Hydrogen (or Non-Protonic) Acid-Base Equilibrium." Dr. Smith spoke principally on Selenium Oxychloride as a parent solvent of a system of compounds (acids, bases and salts) known as the "Selenium oxychloro solvo-system of compounds." Sulphur dioxide and phosgene were mentioned as other examples of parent solvents which do not on ionizing, (like ordinary solvents) give the solvated proton or hydrogen ion. The high conductance of the pure yellow liquid indicates that ion concentration is relatively high. Like water, Selenium oxychloride ionizes and reacts chemically with its solutes. The next meeting of the Trenton Chemical Society will be held Wednesday evening, December 5th. The speaker will be Dr. Hubert Alyea of Princeton University on the subject of "Atomic Energy." Due to the great public interest in this topic at this time, attendance will be limited to two guests per member.



The Man at the Printing Press Depends on Good Calendering



The man at the printing press knows that good calendering makes all the difference in the printing quality of the sheet. He knows that adequate resiliency on the face of the roll produces a soft enough finish to allow for high speed printing. With Butterworth Gold Medal "Long Life" Calender Rolls you get perfect finishes for amazingly long runs before requiring refilling or turning down ... Superior results at low cost. Butterworth Rolls are made to specification and tested for hardness, smoothness and density *before* delivery. We furnish new Rolls or refills for your present Rolls.

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GOLD MEDAL *Long Life* ROLLS

Butterworth Calender Rolls

Kimberly-Clark Corp. Begins Mill Addition

Increased Space To Enlarge Facilities For Experimental and Pilot Plant Work On New Products — Some Wire Weavers Return To Work — Explains Fox-Wolf River Control Plan — Other News.

APPLETON, Wis., November 19, 1945—Kimberly-Clark Corporation, Neenah, Wis., has started construction of a one-story addition at the northeast end of its Kimberly, Wis., mill along the Fox river bank. It is expected that the building will be ready for installation of equipment by March 1, 1946.

The addition will have an overall length of 258 feet and will supply increased space for experimental and pilot plant work on new products developed by the company's war products division.

F. C. Heinritz Named President

Fred C. Heinritz, formerly secretary of the Appleton Coated Paper Company, Appleton, has been named president and general manager, succeeding Charles S. Boyd, who becomes chairman of the board of directors. He remains treasurer of the firm.

An amendment to the company's articles of incorporation providing for the position of board chairman and listing the changes in officers of the company was recorded Wednesday, November 14.

R. E. Boyd, Chicago, continues as vice president, and M. C. Weyenberg was named secretary. R. W. Mahony was named assistant treasurer, and H. D. Berge, Chicago, assistant secretary.

Paper Men Discuss Credit

A credit discussion meeting and dinner was held Tuesday, November 13, at Hotel Menasha, Menasha, Wis., by 22 representatives of paper manufacturing and converting companies. The guest speakers were Elmer Wylie, Chicago, and Victor Eggerding, St. Louis.

Mr. Wylie, who is with the Container Corporation of Chicago, spoke on "Credit in the Reconversion Period," while Mr. Eggerding, with the Gaylord Container Corporation of St. Louis, spoke on "Credit and Public Relations," discussing phases of credit man's responsibilities. A round-table discussion followed the dinner meeting.

Committee members in charge were Robert W. Wood, Gilbert Paper Company, general chairman; Emmett Below, Marathon Corporation, and V. S. Ames, Kimberly-Clark.

Represented at the meeting were: Badger Tissue mill, Kaukauna; Bay West Paper Company, Green Bay; Combined Locks Paper Company, Appleton; Container Corporation of America, Chicago; Freeman Paper Company, Green Bay; Gaylord Container Corporation, St. Louis; Gilbert Paper Company, Menasha; Kimberly-Clark Corporation, Neenah; Marathon Corporation, Menasha; Northern Paper Mills, Green Bay; Straubel Paper Company, Green Bay; Thilmany Pulp and Paper Company, Kaukauna; Tuttle Press, Appleton; Ward Paper Company, Merrill, and Wolf River Paper and Fiber Company, Shawano.

Some Wire Weavers Return to Work

Some weavers at the Appleton Wire Works and Wisconsin Wire Works, both at Appleton, Wis., returned to work Saturday, November 17, after announcement the previous day at Cleveland, Ohio, of the settlement of their strike which began October 17. Operations were to be resumed gradually, beginning Monday, November 19. Other plants affected are in Massachusetts, Connecticut, New York, New Jersey and Ohio. The union involved was the American Wire Weavers Protective Association.

Chinese Technologist Visits Gilbert Mill

Fhu-Tang Hann, a member of the Chinese Ministry of Economic Affairs, is spending about four months in intensive study and work at the Gilbert Paper Company, Menasha, Wis. He is a member of a group of 115 government technologists in different phases of industry—paper making, mining and engineering among them. He spent some time after his arrival in September in visiting various eastern paper mills. The Menasha assignment, however, is his first major one. The first phase of this assignment at Gilbert will be in the laboratories where a course is being mapped out for him by Richard T. Probst, technical director. After that, he will work in the various departments of the Gilbert mill in order to gain first-hand information on American paper production.

He is in this country under the Chinese government's supervision, while about 800 other Chinese young men are in the United States under a lend-lease program sponsored by this country.

Thilmany Increases Wages

An increase of 5 cents per hour for all hourly paid employes of the Thilmany Pulp and Paper Company, Kaukauna, Wis., effective last November 5, was announced November 15 by the company after negotiations with locals of the International Brotherhood of Paper Makers and the International Brotherhood of Pulp, Sulphite and Paper Mill Workers. The company also announced that it had agreed to an additional increase of 10 cents an hour, effective January 28, 1946.

The agreement to pay the higher wages is predicated upon a cutback in weekly hours from 48 hours to 40, and this will be accomplished as additional workers are available. Officers of the union have pledged cooperation in this effort.

Thilmany is considering an upward adjustment in salaries for office and supervisory employes.

Traffic Club Elects Officers

K. L. Spanbauer, Oshkosh, has been elected president of the Fox River Valley Traffic Club. J. P. Schommer, Oshkosh, is the new first vice president; Bob Lorenz, Menasha, second vice president; O. E. Breitengroos, Fond du Lac, reelected third vice president, and Carl Springborn, Oshkosh, fourth vice president.

Arthur Spanbauer, Oshkosh, was reelected treasurer, and Franklin Otis, Neenah, reelected secretary.

(Continued on page 88)

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Operates AUTOMATICALLY. Eliminates fill-ups, insures greater uniformity, by removing destructive substances from felts. Maintains a clean, soft felt during production; quickly pays for itself in longer felt life, savings of paper stock, reduced shower water consumption.

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Favors Redistribution of Forestry Limits

Premier Duplessis of Quebec Speaks On New Form of Forest Conservation For the Province — Newsprint Price Rise Reported — Reports On Cartels With Reference To Newsprint and Kraft.

MONTREAL, Que., November 19, 1945—Speaking before members of the Quebec Association of Forestry Engineers, at their annual meeting in Quebec, Premier Duplessis indicated that the recent action by which cutting rights over large areas of timberlands under the control of pulp and paper companies were exchanged for cutting rights over blocks more conveniently situated to mill sites really marked the inauguration of an entirely new form of rest conservation covering the whole province of Quebec.

"In order to readjust our forestry limits in a more rational way," said the Premier, "we want a redistribution of our forestry limits. At present companies which have mills in one part of the province have been awarded cutting rights in another part of the province, and vice versa, with the result that the transportation cost has increased and has been included in the production cost, and the population has to pay in the end. We hope to remedy this in the future."

Declaring that the Government intended to see that the forests were protected, and to see that those who spend money to develop Quebec forestry resources be given a fair and generous share, he said, "the people who invest capital in the province cannot and must not become owners of our forests, for they belong to the population, and the people must always remain masters of its natural resources."

In emphasizing the need of forest protection and of reforestation, he said that a forestry management plan was urgently needed as well as regular planned cutting if Quebec forests were to be preserved, and he indicated that there would be a sharp reversal of former methods by which companies were allowed to cut wood without limit.

New Forestry Faculty at University

At the same meeting the Hon. J. S. Bourque, Minister of Lands and Forests for the province, lauded the action of Laval University at Quebec, in the policy just announced for raising its school of surveying and forestry engineering to a faculty, and named Avila Bedard, Deputy Minister of Lands and Forests, dean of the new faculty. He said the Government realized the importance of forestry engineering in the province, and was ready to help in the construction of a new building to house the new faculty. Laval University, however, would have to share in the expenditure involved. He recalled that through the collaboration of the provincial government, Quebec Province had recently been awarded a $15,000,000 contract from France for pre-fabricated houses.

Newsprint Price Rise Reported

Coincident with the news that production and shipment of newsprint by Canadian mills expanded during October to the highest level in about four years, it is persistently reported here that a rise in the price of newsprint by $5 per ton may be expected to go into operation on January 1 next. This is supported by news, reportedly from authentic sources in the United States, that an increase to this extent has been practically decided upon by the authorities as one means of offsetting a growing tendency among newsprint companies to shift production to more profitable lines. In this latter connection it is interesting to note that while production of newsprint in Canada in October represented 82.8% of capacity, as compared with 70.4% in October, 1944, the actual annual capacity of Canadian newsprint mills is some 58,000 tons less this year than in 1944. The actual figures, as recorded by the Newsprint Association of Canada, shows the annual capacity in 1945 to be 4,300,800 tons, as compared with 4,358,500 tons in 1944.

Reports on Cartels and Paper

Some interesting references to newsprint and kraft paper are contained in a report by a Federal Government Commission dealing with the effect of International cartels on commodities in which Canada is interested. The report notes that such control as there has been over newsprint, apart from that during the war period, has been entirely a domestic arrangement among Canadian mills undertaken initially at the instance of certain provincial governments, and that, so far as the Commission was informed, use of common sales agents in outside markets, or participation in joint contracts with groups of newsprint users, did not involve understandings with newsprint producers in other countries.

Dealing with various efforts to pool orders and allocate tonnage among Canadian mills, with direct reference to United States interest in these arrangements, the Commission holds that such arrangements as sponsored in past years by the Provinces of Quebec and Ontario, "would be unacceptable under the terms of any international agreement to eliminate restrictive practices." It is noted that the proration system was a product of depression, but the Commission expresses the opinion that should the problem of surplus capacity in the newsprint industry become acute once more, it would be extremely difficult to avoid a return to some concerted measure of restriction by the Provinces of Quebec and Ontario. The suggestion is made, therefore, that, should an international convention on cartels be put into force, it might be necessary to attempt some agreement with the government of the United States, the main consumer, by which such arrangement might be countenanced to prevent temporary demoralization in the industry.

Touching upon kraft paper, it is reported that in 1935 Canadian producers made arrangements with an association representing principal manufacturers of kraft paper in Scandinavian countries under which this association would regard the Canadian market as reserved for Canadian mills, while Canadian mills would accept European mrkets, other than the United Kingdom, as Scandinavian territory. In the United Kingdom, shipments from Canada were confined to agreed tonnages, at prices uniform with those quoted from Scandinavia.

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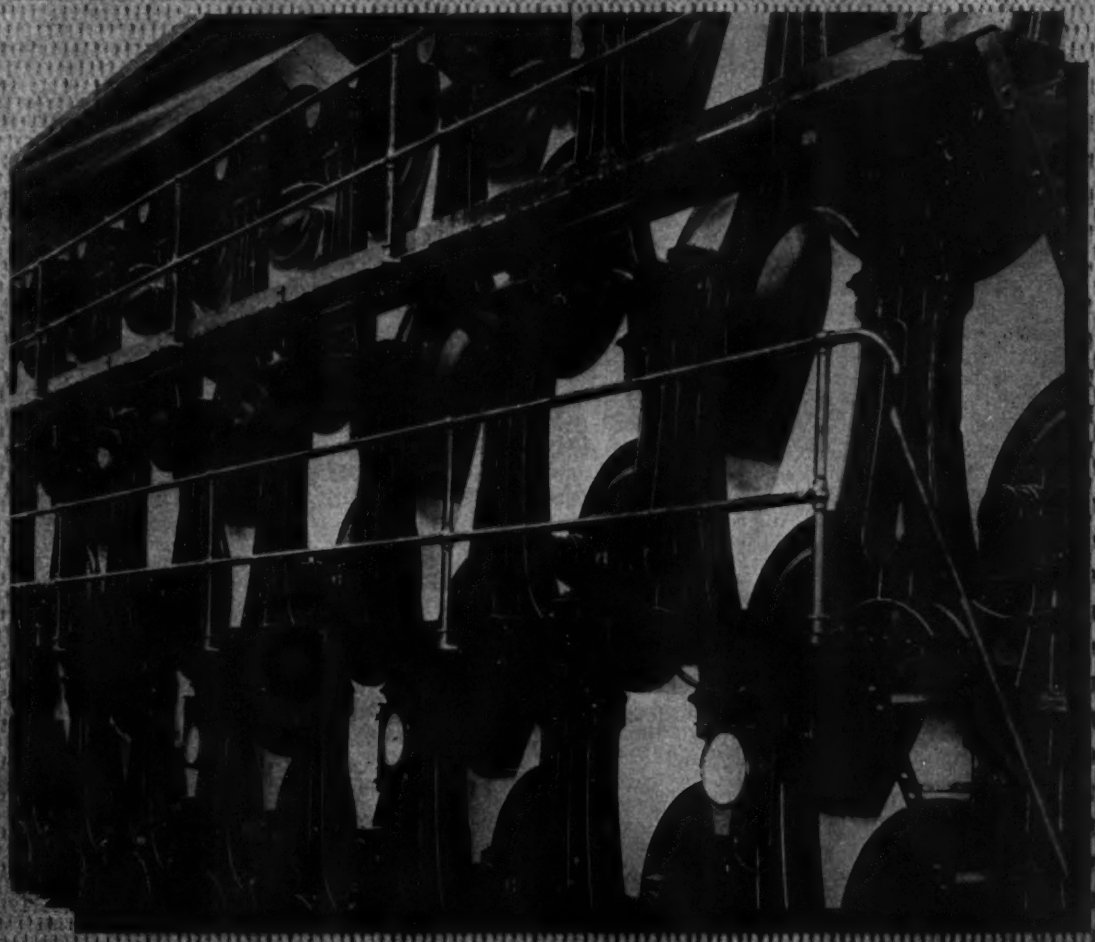

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Multiply the qualities in RICHLAND TRIPLEX dryer felts by the number of replacements you make in a year, and here's what you get every time . . . *standardized* economies of longer wear, high porosity, resistance to stretch and shrinkage, contact surfaces that stay smoother for a longer period of time. Top grades of cotton plus uniformly woven fabrics make these economies consistently possible when you specify RICHLAND TRIPLEX all-cotton dryer felts.

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Low Inventories Hamper Promotional Plans

Some New Paper Lines Added But Price Schedules and Marketing Programs Are Not Yet Completed—Import Paper Co. Expands—Salesmen To Hold Christmas Party On December 20—Other News.

CHICAGO, Ill., November 19, 1945—Little change was noted in the Chicago paper market this week. Paper sales representatives here reported that their sources of supply were having difficulty interpreting future plans of the CPA and OPA while jobber representatives of the trade were finding it hard pressed to find sufficient inventories to begin long delayed promotional programs. Some new lines have been added locally but most of the news is of new lines on which proper prices and marketing programs have not as yet been reported as perfected.

Some considerable interest was indicated in the statement made by F. G. Stevenot, president of the Puget Sound Pulp and Timber Company that the "industry's crisis is at an end" and that supplies of wood pulp in the first eight months of this year exceeded requirements by 92,000 tons. He added that inventories at the end of August totaled 425,000 tons, equal to 12.1 days consumption, up from 319,000 tons or 8.9 days supply at the end of February. For comparative reasons, figures for August, 1942, were also shown which revealed that at that time the pulp industry had 978,000 tons on hand, equal to 23.4 days consumption.

Prominent Paper Leaders Expand Operations

This week another "success" story was emphasized as two former salesmen in the paper industry, materially extended their interest in Chicago's paper trade circles by acquiring the capital stock of the Import Paper Company on Chicago's west side. The two men who, during the past twenty years have made quite a record for themselves, are P. J. Gallagher and L. J. Donahue, heads of the Marquette Paper Company, Blundon-Lyon Paper Company, Copy Papers, Inc., and the Marquette Paper Corporation. Their added success comes as another phase of a step by step progress beginning back in the days when they operated an aggressive sales office from headquarters at 608 S. Dearborn as the Marquette Paper Company. The company expanded, acquired additional operations and now is located at 700 West Lake street, just a block away from the Import Paper Company. It is reported that Charles Biggam is to be secretary-treasurer of the new owners of Import and will thus represent the interests of Mr. Gallagher and Mr. Donahue. However, Mr. M. E. Immerwahr, former owner of Import, will continue in his capacity as president of the company thus fulfilling an expressed desire to maintain some connections with the firm and yet be removed from heavy management responsibilities. Import began as a factor in Chicago's paper trade circles nearly thirty three years ago and brings to the present amalgamation of interests an equally fine record in fine paper circles.

Complete Christmas Party Plans

The western division of the Salesmen's Association of the Paper Industry now has its Christmas program completely arranged. The annual Christmas party is slated for December 20 though whether or not it is to be a noon or late afternoon or evening affair has not as yet been indicated. On December 17 the Right Reverend Wallace Edmonds Conkling, Bishop of the Chicago Diocese of the Episcopal Church, will give his annual Christmas message to the members of the western division. Bishop Conkling is chaplain of the Salesmen's Association of the Paper Industry, having succeeded the late George Craig Stewart in that position. He is extremely popular with the SAPEYES and his annual Christmas message has become a highlight of the entire year's program.

Paper Milk Bottles Adopted

Chicago has, at long last, completely buried the altercation over the use of paper milk containers in this city. Last week the City Council voted to extend the use of paper milk bottles permanently as compared to the present restricted approval of the use of such containers during the war period. Thus comes to an end litigation begun many years ago and fought through the courts month after month, year after year. The final decision of the city council is adequate testimony to what public acceptance of an item of utility and economy can do to outmoded statutes with somewhat strange and vague backgrounds.

B. C. Nelson Made General Manager

B. C. Nelson, well known to the paper trade in this territory, has recently been made general manager of the Paper Service Company, 255 E. Illinois street. He is reported to have succeeded F. C. Strang, no longer associated with Paper Service. Announcement was also made of an expansion of the lines now represented by the company, backed by aggressive sales promotion.

Tested Papers Inc. Elect Officers

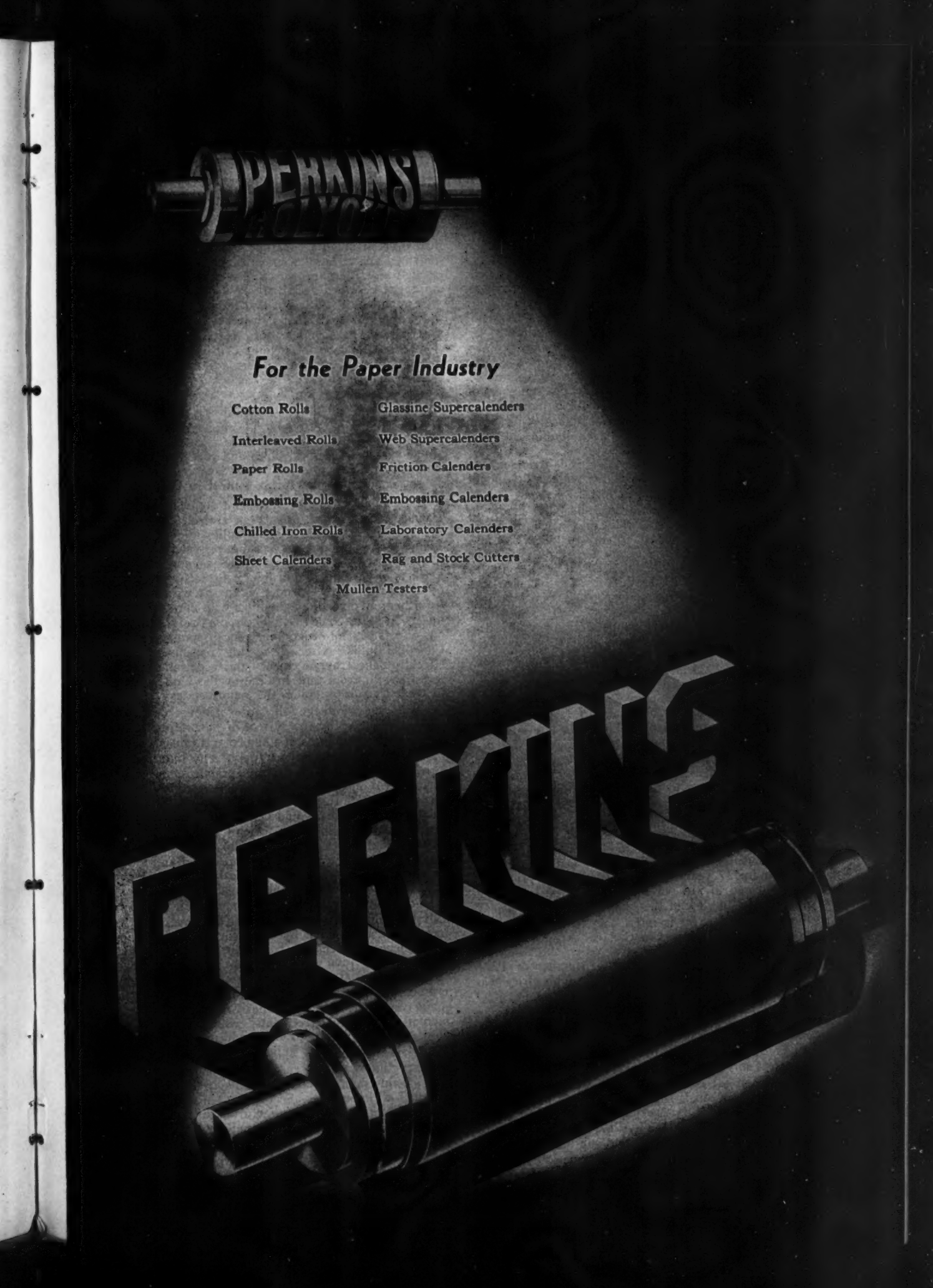
The annual meeting of Tested Papers of America, Inc., held in Chicago around the first of last month, resulted in the election of the following officers: Chairman of the Board, R. W. Miller; President, Frank Vaughan; first vice president, R. C. Kettles, Jr., treasurer, E. P. Magel, Secretary, C. A. Spaulding, assistant secretary treasurer, G. B. Slater. It was also announced that Lieutenant Thornton Snead was expected to be out of the armed forces and back as head of the retail merchandising program on or about January 1.

Will Discuss Paper Tests

The Chicago Professional Paper Group this week announced that Major James d'A. Clark, speaker for its November 19 meeting, would discuss "Paper Tests —Their Interpretation and Meaning." Announcement of the meeting, unavailable last week, discloses the fact that Major d'A. Clark, connected with the Quartermasters Division of the U. S. Army, will demonstrate the results of many tests which are applicable to paper and paper products and which can be simply expressed and usefully applied.

Curb Lifted on South American Exports

The Canadian Government has notified various governments in South America that, starting April 1, 1946, restrictions on exports of newsprint to South America will be lifted.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Canada Looks Into Cartel Question

Dominion Agency Reports Findings On Effects of International Agreements On Chemicals — Studies Allocation and Proration of Newsprint and Kraft Under the Shifting Conditions of Market.

TORONTO, Ont., November 17, 1945—Recently a Dominion agency known as the McGregor Commission reported to the Canadian government on cartels. It presented a very lengthy and exhaustive document, covering many months of investigation. The daily press gave the report only highlight attention. The enterprising Financial Post, however, has gained access to the original document and publishes in a current issue a comprehensive digest on what the report has to say on specific articles of commerce. Among these specific references are a number of commodities sold to the paper making industries in considerable quantities, such as potash, nitrogen, phosphorus, sulphur, magnesia, titanium, soda and other chemicals.

Here are a few samples of cartel arrangements affecting commodities for which Canada is dependent wholly or in large part on imports:

Potash—Arrangements were allegedly made in 1926 between German syndicate and French producers to share world markets, Germany to take 70% and France 30%. Uniform prices at American ports were maintained between 1924 and 1933. Polish producers were given 4% of the world markets in 1932. In 1934 Russian, Spanish and American production began to show increases and price cuts of 50% resulted in North America. The new competition apparently was soon "looked after," the report observes and prices at U. S. ports gradually increased, and kept constant during 1937, 1938 and 1939. A branch of European Cartel Sales company was established in Montreal in 1928. In 1932 this company incorporated as Potash Co. of Canada, Ltd., subsidiary of German-French cartel, headquarters then in Holland. The close relationship between the cartel and the American distributors provided an opportunity for Canadian manufacturers and distributors of fertilizers to formulate common policies as to prices and conditions of sale.

Sulphur—The report states that "elimination of competition in world markets and control possessed by two principal American producers permitted the price of sulphur in the U. S. to be maintained, regardless of business conditions, at . . . fixed level of $18 per ton for 17 years, prior to 1938." The price was then lowered to $16 per ton, which became the new fixed level. "In view of the stability of sulphur price," the report states, "it is interesting to note the trend of sulphuric acid prices in Canada. After remaining firm at $12 per ton for several years, the wholesale price advanced three times in the summer of 1929, to become stabilized at $16 per ton. This price was held all through the depression years and on into 1937 when it increased to $17 per ton. This suggests an aspect of price policy which should warrant closer examination, that is, in the absence of competition, prices may move upward rapidly, but may be resistant to any downward movement."

Soda Ash—It is stated that the only manufacturer of soda ash in Canada is Brunner-Mond Canada, Ltd., which "apparently" is associated with Solvay Process Co., American subsidiary of Allied Chemical and Dye Corp. The report states that two substantial users of soda ash indicated that in the pre-war period, attempts had been made to secure quotations from producers outside Canada, but that in each case, it was impossible to find any alternate source of supply as the market appeared reserved for Brunner-Mond Canada, Ltd. The report also points out that the latter company, in its reply, indicated "that it had not entered into any international arrangements of a restrictive character." However, the report concludes, "in view of the fact that the Canadian company is a subsidiary of an American corporation, the Canadian market might have been reserved for it by reason of arrangements made outside Canada by the parent company."

Much the same testimony is contained in the report respecting many other chemicals, as well as such things as electric lamps, pipes and tubes, radio tubes and sets, metals, pipes and tubes, etc., and it has this to say concerning newsprint control in Canada.

It is emphasized that newsprint control, so far as Canada is concerned, "has been entirely a domestic arrangement among Canadian mills undertaken initially at the instance of certain provincial governments." Even use of common sales agents in outside markets or participation in joint contracts with groups of newsprint users did not "so far as we have been informed, involve understandings with newsprint producers in other countries." The report refers to various efforts to pool orders and allocate tonnage among Canadian mills. After discussing reasons for and effects of these arrangements and especially the interest shown from time to time by the United States in what Canada is doing, the report states:

"The rigid tonnage allocation among newsprint producers set up by the system of "prorating" sponsored by the Provinces of Ontario and Quebec would be unacceptable under the terms of any international agreement to eliminate restrictive practices, and would invite attention under almost any international agreement for the mitigation, investigation or control of such practices. This would be the case with similarly restrictive arrangements in which Canadian exporters of other commodities might participate. The proration arrangement was a product of depression and would be unnecessary, perhaps impracticable, in prosperity, but if the problem of surplus capacity in the newsprint industry became acute once more, it would be extremely difficult to avoid a return to some concerted measure of restriction by the Provinces of Ontario and Quebec. Under such conditions, and if an international convention on cartels were in force, it might be necessary to attempt some agreement with the government of the United States as representing the main consumer, along the lines of the 'intergovernmental commodity agreements,' which appear to be envisaged as solution to the problem of temporary demoralization in basic industries."

Respecting kraft papers, the report states that Canadian producers made arrangements in 1935 with an association known as Scankraft which has been formed by principal manufacturers of kraft paper in the Scandinavian countries, under which this company would regard the Canadian market "as reserved

(Continued on page 98)

KALAMAZOO GLAZED TILE TANKS FOR POST-WAR PLANS

Equipment is being worn out rapidly during our all-out war production program. When the war stops, much of it must be replaced with a minimum of delay.

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New Electronic Applications in the Paper Industry

By D. B. GEARHART, Sales Engineer
General Electric Co., Grand Rapids, Mich.

While at first thought it may seem that all electronic applications are new, actually only some of the industrial applications of electronic apparatus are new. It might be well, therefore, to examine this statement before proceeding further, but to do so it is necessary to define clearly what is meant by an electronic application.

Obviously an electronic application must involve electronic devices. What are electronic devices? According to those who view electric current as a flow of electrons through a conducting medium, any electric device is also an electronic device. However, the acceptance of this definition would open this article to a discussion of new applications of motors, controls, transformers, or combinations of the same. Thus, since these subjects are not within the intended scope of this article, that definition must be revised.

We shall define as "electronic" any device through which current continues to flow when there is no metallic conductor. The unrestricted use of this definition, however, would include such an old tool as the arc lamp. We will go further with our definition, then, and say that an electronic device will be enclosed in an envelope from which the normal atmosphere has been exhausted and, in some cases, replaced by a special atmosphere.

We have now defined a device which becomes a most useful took when used in combination with other electric and mechanical devices. In fact, from popular magazine articles and advertisements we learn that we are on the threshold of "The Electronic Age."

A word of caution, however. What we have done is discover a tool which is truly marvelous and offers great possibilities, but which is still only another tool. This tool is the electronic tube. Alone this tube is incapable of doing anything but, in the hands of the electrical engineer, it may be used in conjunction with other familiar electric devices in accordance with known engineering and economic laws. By its use, many functions that can be accomplished in no other way are now easily realized—other results, obtained with difficulty or only partially, are now made possible.

However, as with all new and fascinating tools, it is sometimes likely to be used by design and application engineers to perform uneconomic functions, or to do jobs that might be done in a simpler, more conventional manner with satisfactory results. Since the earliest applications of this tool were in the communications field—radio and long-distance telephone—the intricate details of its functioning and its related circuits are best understood by engineers whose experience may have been entirely or largely in the communications field. Especially is this true of those engineers called upon to design electronic apparatus.

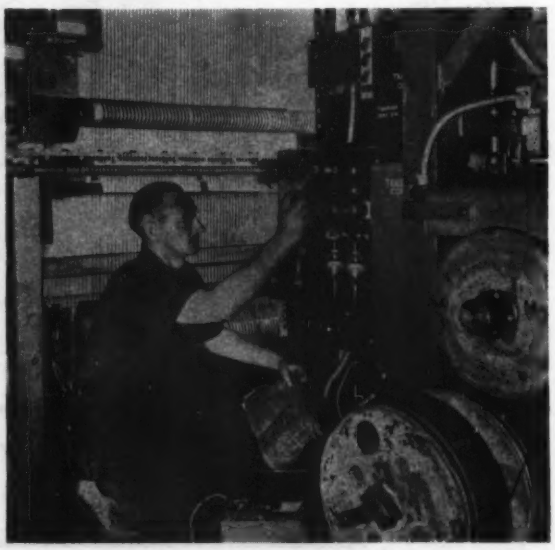
While reliability has been an important factor in the design of communications equipment, there has not usually been the necessity of considering many of the factors which affect the design of industrial equipment, particularly such conditions as are caused by the environment peculiar to the industry in which the apparatus is to be applied. There is, of course, nothing new to this restriction, since it applies equally to the design of motors, switchgear, etc. Yet, it is a factor which must be kept in mind not only by the manufacturer who hopes to continue to sell his product at a profit and with a reasonable service expense, but also by the purchaser who expects to get value in full for the purchase price.

Let us now examine what this tool will do for us. There are eight ways in which electronic tubes can perform, in most cases doing each job in a manner unequalled by other devices.

Electronic tubes can respond to extremely small electric signals. Through their use large amounts of power can be controlled with a negligible energy input. In other words, just as a steam turbine operator can open and close a valve and control the flow of thousands of pounds of steam per hour at a pressure of hundreds of psi, so can the flow of a few thousandths of an ampere of electric current through the water of a liquid level gage be made to control the starting and stopping of a huge motor driving a pump.

Electronic tubes can respond at speeds far beyond those attained by other sensitive devices. For most industrial considerations this speed can be considered as instantaneous. Therefore, when using electronic tubes in a drive, the regulation of speed becomes a factor entirely of the effect of the WR2 of the drive and machine, the torque applied, and the ability of the other components to accommodate themselves to the new conditions.

Some electronic tubes respond to light signals. This



Final operating adjustments being made on G-E "Thy-Mo-Trol" drive applied to speed control capstan in G-E plant.

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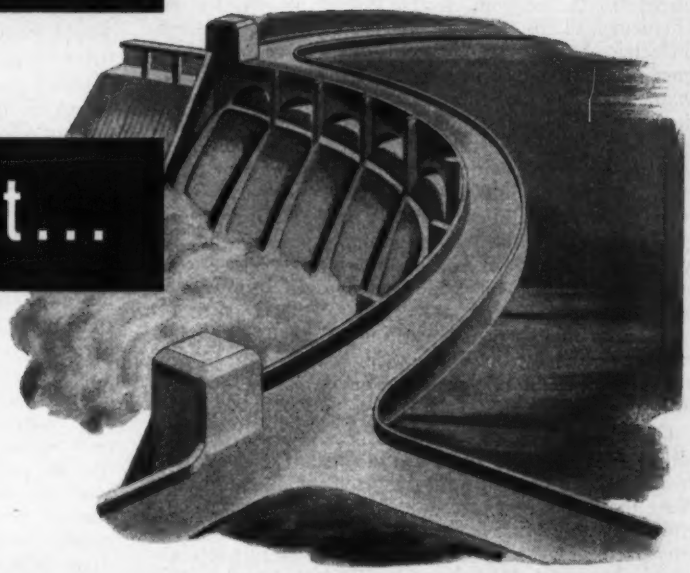

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has resulted in the application of these special tubes to various register controls.

Electronic tubes can, and usually do, allow electric current to flow in only one direction. Thus, when fed with alternating current, they act as check valves and permit only the flow of direct current, i.e., they rectify a-c into d-c.

Certain electronic tubes can transform electric current into light or similar vibrations, such as fluorescent light, X-ray, or ultra-violet ray.

Because of their ability to respond to signals at extremely high rates of speed, and because they will permit the passage of current in only one direction, electronic tubes can be used to trigger the flow of direct current into an electric circuit at any desired frequency. Thus, they can be used in induction and dielectric heating applications, which require frequencies that cannot be generated directly. (A radio man would say that the tube "oscillates.") The tube designer, by adjusting the various elements and atmosphere within the tube, can control these abilities over an extremely wide range. In general, however, such designs fall into two distinct classes: (a) completely evacuated tubes, and (b) tubes having a pure gas, or special mixture of gases, replacing the air which was withdrawn. Each of these classes illustrates another manner in which electronic tubes can perform.

Vacuum tubes act as throttling valves. Within the range selected by the design, the flow of power will vary directly (along the design curve) with the controlling pressure.

Gas-filled tubes act exactly as trip valves, passing all the current that the external circuit will permit from the time tripped until the circuit is de-energized. Note that once tripped, the control circuit loses control entirely until the circuit being controlled is de-energized. The time this circuit is de-energized may be of extremely short duration. Recall that the tube also acts as a check valve, passing the current in only one direction. If the tube is fed with a-c, the control circuit can again become master when the voltage is at zero, or attempting to force current through the tube in the opposite to normal direction.

We have seen that members of the electron tube family can (1) respond to small signals, (2) respond instantaneously, (3) respond to light, (4) act as a check valve to rectify a-c to d-c, (5) transform electric current into light, (6) change d-c to a-c, (7) act as a throttling valve, and (8) act as a trip valve. Here is such a versatile tool that it is small wonder that we read of "The Electronic Age."

What do we need to put this tool to work for us in industry? Already, because of the imagination of application and design engineers, we have the photoelectric relay for the control of side registers on rewinders and color registers on presses. The photoelectric pyrometer will watch a flame or a piece of metal being heat treated, and will indicate, record, or control the temperature. The radio, long-distance telephone, and television are results of imagination on the parts of communications engineers.

The need for a constant-tension drive for wiredrawing machines long ago led G-E engineers to develop electronic motor controls for company use. Further developed, field-tested, and so standardized as to be applied by sales engineers without special electronic training, these controls are now a standard market product. The question is, therefore, what do you want in the way of new electronic applications in the paper industry? What are you doing now that is not being done to your complete satisfaction? What would you like to do that, thus far, has not been possible? Perhaps with this tool, it will be possible to do your job to your better satisfaction.

In searching for new applications, however, certain considerations must be kept in mind. How much benefit will be derived from the desired improvement? Savings evolved by eliminating losses resulting from poor register have quickly paid for the installation of many of these equipments. Perhaps the elimination of other hidden losses would justify the installation of constant-tension drives, look controls, or paper break detectors. Perhaps the possibility of increased production or higher quality would justify the installation of electronic sectional drives.

Can your mechanical equipment be adjusted, so as to realize the benefits to be gained by the introduction of electronic circuits? For example, cases of beer can easily be counted by viewing them with a phototube as they pass down a conveyor. To count sheets of paper, therefore, your machine equipment must be adapted to do much the same thing. You must be sure that these mechanical changes do not introduce losses and difficulties which would offset the gains made by the electronic innovation.

Will it be possible to design the mechanical system necessary to initiate the controlling signal? For example, the speed of a driving motor can be adjusted over a range of 35:1, or even higher if necessary. The control device may be a coil with a moving iron core weighing only a few ounces, or a small rheostat like the volume control of a radio, a photoelectric tube, or some other source of a small amount of control power. Bear in mind, however, that the results obtained from the application of an electronic drive will be only as good as the design of the mechanism which operates this drive.

Will this tool enable you to produce better paper or do a better printing job?

Thus, while we have a marvelous tool, it is one which imposes upon designers, application engineers, sales engineers, and user alike, the obligation of learning all of its tricks, its weaknesses, and its abilities. At the same time, each must learn more about his own job in order to use intelligent engineering judgment in its application.

M. D. Summer Goes to Union Machine Co.

Murel D. Summer, Lewiston, Me., former assistant general manager of the J. W. Penney & Sons Company, of Mechanic Falls, Me., and widely known in the paper mill industry of New England, was today appointed general sales manager of the Union Machine Company and the Union Screen Plate Company, Fitchburg, Mass. The appointment was announced by Lester L. Foss, treasurer of the local companies.

Americans Invest in Paper Securities

The upward movement in pulp and paper securities on the Montreal Stock Exchange has continued during the past week, with these securities still supplying market leadership. It is stated here that American buying has been an important factor in this upward movement.

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Oilgear Fluid Power Units of this type are used for roll hold-downs and lifts on many types of paper machines.

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Fluid Power

Hydraulic Barker Saves Manpower and Wood

By H. E. Bukowsky
Crown Zellerbach Corporation

No instrument in recent years has been more noteworthy in effecting savings of manpower and in the elimination of waste than the hydraulic debarking machine developed at the paper mill of the Crown Zellerbach Corporation at Port Townsend, Washington. The device has aroused the interest of not only pulp and paper manufacturers, but sawmill operators as well.

The removal of bark from logs, of course, is an old problem of the pulp mills. It has existed since the day paper was first made from wood. Many log cleaning methods were developed. Among those most commonly used today are the barking drums in which short log sections are tumbled about in huge hollow slatted steel cylinders; power-driven, knife-carrying discs against which wood blocks are manipulated to permit the knives to cut the bark off; power-driven machines resembling wood planers, and the laborious way of spudding off the bark by hand, a method usually practiced in the woods, where trees are felled in the loose bark season. All of these methods require that the wood be in relatively small pieces. There is, therefore, a handling cost of considerable consequence, and in most cases a loss of valuable wood.

In the Pacific Coast region of the United States and Canada wood cleaning methods in the past have been very much the same as those employed elsewhere. There has been a greater incentive in that section to depart from the conventional methods because of the size to which western trees grow. It has been recognized for many years that it is uneconomical to reduce a large log to small blocks for the sole purpose of removing the bark. The desirable way, it was argued, was to handle as large pieces as possible, thus avoiding the saw kerf losses and opening the way for less handling. Steady progress was made in this direction and by 1931, in the wood mill at Port Townsend, logs 20 ft. in length were handled through the cleaning process into chippers, which were large enough and so installed that this could be done. But while such long logs were being run through the wood mill the cleaning methods still required sawing the logs lengthwise into pieces of small cross-sections.

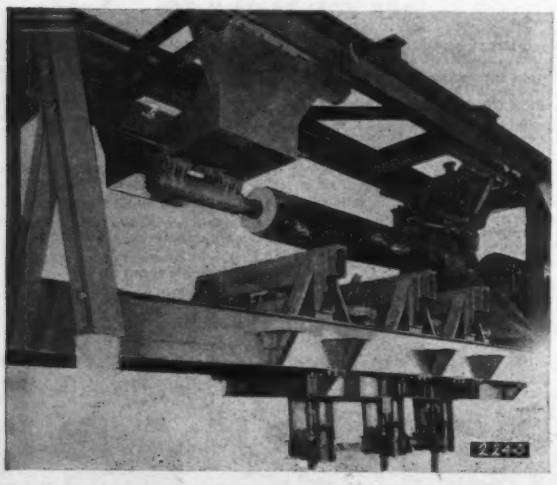

FIG. 1

Close-up of barker, showing frame, suspended tail stock at left, nozzle carriage at right, log raising devices below frame, and at extreme right the headstock and vertical twin steam engine drive. Log shown engaged by tailstock ready for rotation is 27 in. diameter 18 ft. long.

Most of the pulp and paper mills, so far as they were able, then followed this procedure; but none of the mills escaped entirely the saw kerf losses, nor the greater loss of wood resulting from the use of knife barkers.

The next step following the one in 1931 was to remove the bark from the logs without sawing them. Several types of log barker were built in which the whole log was rotated while power-driven knives removed the bark. These did not become important developments since they left much to be desired in wood economy.

Throughout the years it was recognized that hydraulic cleaning of logs would solve all cleaning problems. The subject of hydraulic barking is therefore not new—it is only the processing of whole logs and the machines that are new.

Not much was known in the beginning of the developments about the pressure and water volume required to remove bark. But having once made the selection of several forms of machines suggested by our problem, enough equipment was set up to determine by experiment the relation between pressure, volume and rate of bark removal. The result of this work indicated that 650 psi. would be the desirable pressure for our requirements. The rate of bark removal was found to be directly proportional to the volume of water directed at the log and approximately equal to 0.25 sq. ft. per gal. These figures were encouraging enough to justify our venture into the design and construction of a machine that could operate on a production basis.

Production requirements at Port Townsend, when the design of the machine was undertaken, demanded the cleaning of 60 logs per hour, the logs averaging in diameter 18 inches, and in length 18 feet. The logs then used were hemlock and white fir, and as brought into the wood mill ranged from 12 inches in diameter to 54 inches in diameter from 12 feet to 22 feet long.

The design of the machine shown in Figs. 1 and 2 was based upon that of a simple lathe with its frame, head-stock, tail stock and carriage. Fundamentally the only departure was that we substituted a nozzle for a cutting tool on the carriage. With this construction the time spent in cleaning a log is composed of that required to handle the log into and out of the machine and that required to do the actual cleaning. It was comparatively simple to calculate the time required to do the cleaning, but estimating the time required to handle the log depended upon the devices used to do the handling. These devices were yet to be designed and there were no conventional patterns to follow. Since the machine was to be of lathe type, the log had to be conveyed broadside toward the lathe centers and then raised to that

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height at which the log would run reasonably true when it was engaged by the lathe centers. Conveying the log to and from the machine was to be done by a conventional chain transfer conveyor. But raising the log required some rugged, simple and positive device which would raise the log regardless of its diameter to proper centering height and then automatically stop.

The raising device which finally evolved from concentration on the problem consisted of an arrangement of two crossed arms independently pivoted to a common base. Suspended below the base was to be a hydraulic cylinder and crosshead having two connecting rods, one going to each of the arms above. The arms each were to be provided with two principal upper surfaces, one of which was to press upward against the log to raise it and the other to come into contact with the log at such point that its contact prevented further upward motion of the log. Fig. 3 is a diagram showing the principle of this device.

The completed design of the raising device now permitted a reasonable estimate of the time cycle of handling per log. Summarized, this cycle comprised conveying the log to within reach of raising arms 3 sec., raising log and engaging tailstock 3 sec., lowering arms and accelerating log 2 sec., raising arms to remove log 2 sec., retracting tailstock and lowering log 2 sec. or a total of 12 sec. This cycle was considered to be conservative, but it turned out to be the actual one when the machine was put into production and the operator had become accustomed to the controls.

At this point we would be expected to say that with 12 sec. out of 60 sec. alloted to the complete handling of the log we would have 48 sec. remaining to clean the log and that a pump of 350 gpm. capacity would be adequate. Actually we installed a pump of 550 gpm. capacity with the expectation that the extra capacity would be useful for additional barking capacity should that be desirable. Thus, instead of a 60-log per hour capacity, we ended with a peak capacity of from 90 to 100 logs per hour. The extra pump capacity is proving useful in that owing to war conditions we are now cleaning considerable quantities of Douglas fir which carries from four to five times as much bark as do hemlock and white fir.

Some experimenting with nozzles was done and

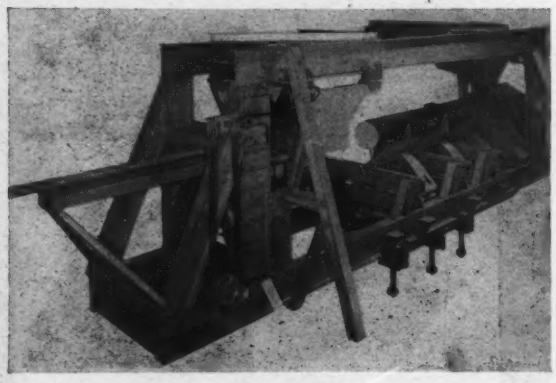

FIG. 2

General view of barker. Long slender cylinder at left actuating tailstock has 16 ft. stroke. Log is shown raised to centering height ready for engagement by tailstock and head stock. Log raising arms are lowered while log is rotated.

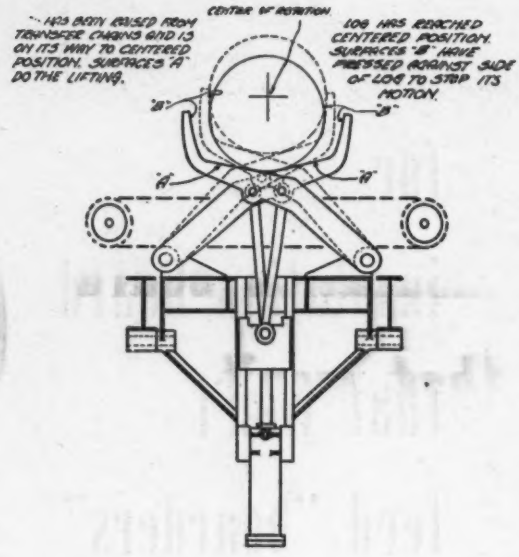
CENTER OF ROTATION
LOG HAS BEEN RAISED FROM TRANSFER CHAINS AND IS ON ITS WAY TO CENTERED POSITION. SURFACES "A" DO THE LIFTING.
LOG HAS REACHED CENTERED POSITION. SURFACES "B" HAVE PRESSED AGAINST SIDE OF LOG TO STOP ITS MOTION.
"B"
"A"

FIG. 3

it would be profitable to do more of it. The nozzle now used is simple; that is probably its greatest virtue. It has a rectangular passage converging from 2 in. by 6 in. to 3/32 in. by 6 in. It is fed by a 4 in. pipe through a transition section changing from 4 in. diameter at one end to 2 in. by 6 in. at the entrance to the nozzle. The 550 gpm. are thus pumped through an orifice 6 in. wide. The jet for a distance of about 9 in. from the nozzle tip remains fairly compact, and at this point impact with the log takes place. Adjustment of the position of the nozzle with respect to the log in the Port Townsend installation is maintained by means of a steel shoe on the nozzle which is held against the log with an air cylinder mounted on the nozzle carriage. This cylinder is under control of the operator and as desired by him the nozzle can be lowered to the log or raised from it as the operation demands. An improvement on this arrangement is now being made by which the nozzle shoe is held from contact with the log, thus permitting higher rotative speed of the log and generally relieving the nozzle from shocks.

The nozzle carriage shown in Fig. 1 photo has four wheels by which it is suspended from the upper panel. At the extreme right of Fig. 4 photo is shown the nozzle carriage drive. Its function is to advance the carriage a distance equal to the nozzle width for each revolution of the log. Two Airflex clutches are used in the assembly in conformation with a 5 h.p. motor and speed reducer. Engagement of one clutch advances the carriage from the head stock end toward the tailstock. This motion is derived from the log turning head stock spindle through the pair of bevel gears. During this motion the nozzle is brought into action against the log. Practically all logs are cleaned by one passage of the nozzle. Having reached the tailstock end of the log, the nozzle is raised and the clutch released. The second clutch is brought into engagement as the first is released. This engagement brings the carriage back to its starting point since the second clutch is now engaged with the motor and

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FIG. 4

View of barker from headstock and showing steam engine to rotate log and nozzle carriage drive. Log is in position for cleaning.

speed reducer. During the interval of clutch operation and the return motion of the carriage the cleaned log is removed from the machine and the next log brought into position for cleaning. This is the 12 sec. interval mentioned previously.

It should be mentioned now that the pump supplying water to the nozzle also supplies water to the hydraulic cylinders of the log raising devices and the tailstock. The relatively large amount of power thus makes it possible to maintain the 12 sec. schedule on the logs which range in weight from one to ten tons.

The machines when installed are enclosed with a steel housing over the top and a steel hopper under the bottom. All spent water and bark fall to the bottom of the hopper where a chain conveyor dragging the bark over a perforated steel plate takes the bark away while spent water goes through the perforations. The fine bark passing through the perforations with the water is screened out on a vibrating screen. All bark goes to the boiler house as fuel.

The justification of the hydraulic whole log barker lies in the saving in manpower and useful wood effected. The savings in manpower are evident in that logs can now be cleaned by one man and be passed directly to the chippers. Saw kerf losses are reduced to a negligible amount and the loss of wood by the action of the nozzle is practically zero.

Sawmills have not yet begun to debark logs in preparation for lumber manufacture. Their interest is evident, however, and it is safe to predict that in the near future hydraulic barking of saw logs will be commonly practiced. Thus the bark laden slab wood waste now being converted into fuel will appear as cleanly debarked slabs of wood that can readily be converted into chips for paper mills with decided advantages to both the sawmill and the paper mill.

Industry Protests OPA Policies

Representatives of the pulp and paper industry have registered a strong protest against OPA policies to support their plea for relief from these policies. In a letter that set forth the views of industry representatives, made public this week, the industry pointed out the unhealthy conditions that are forced into the trade by the operation of OPA rules.

"Supply and demand," the protest declares, "will never be in balance until the present rigid OPA policies and procedures are brought into alignment with the present day economic conditions, or until natural economic laws are permitted to operate without price regulation. In fact the conditions as between a balanced supply and demand situation promise to get rapidly worse unless OPA will recognize the inevitable grade shifting that is taking place through increasing costs now controlling the production of low end products.

"Several illustrations of this situation were cited and you no doubt will recall the existing situation involved in the shift of manufacturers from the production of grocery bag paper, which in the final analysis involves the question of public sanitation. Present OPA pricing policies as related to low end products will inevitably, in the long run, reach a point where surpluses may even exist in higher priced items and acute shortages in low priced items. This is inherent in the character of the industry. Opinion of the industry representatives was unanimous with regard to this situation.

"With regard to the effect of shortages of fiber supply, it was the consensus of opinion of the industry representatives that here again this was incident to the unrealistic approach of OPA in not adopting pricing practices suitable to the character of the industry. It was the general belief that production would be maintained at maximum levels if reasonable profit incentives were offered to stimulate this production. Lacking such incentives essential production is bound to decline, as operating conditions become more difficult and as fiber continues to remain scarce.

"At this point in our discussions, the issue was raised that with the elimination of the War Production Board, whose interests lay in production, OPA must assume a part of the burden and responsibility laid down by WPB and recognize in a realistic way the effect of its pricing policies on produtcion. The chaotic condition that now exists within the industry in its production schedule is bound to become more aggravated unless recognition is had in OPA of the character of the industry and the effect of the inflexible application of its rules and practices as now applied.

"With regard to new capacity that will be brought in with new machines installed or machinery built, it was the general opinion of the industry representatives present that this capacity could not be in production in sufficient time to materially affect the present situation. If mills could give their sole attention to more output instead of having to schedule mill operations with profit margins in mind, it was felt that the output of existing capacity could be increased approximately ten per cent.

"While the impact of the labor situation was not discussed as thoroughly as it probably deserved, yet

(Continued on page 116)

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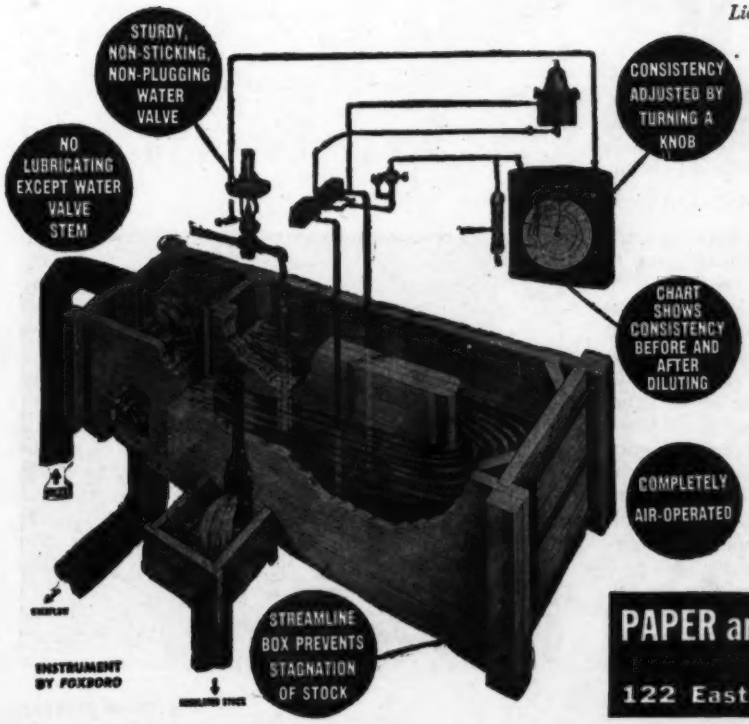
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STREAMLINE BOX PREVENTS STAGNATION OF STOCK
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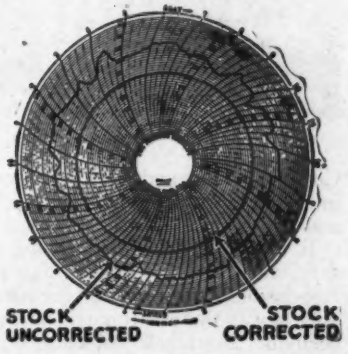
Licensed under U. S. Patent Numbers: 1,810,111—1,884,075—2,302,326—2,302,327



24-hour record chart, showing consistency before and after diluting water has been supplied

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PAPER and INDUSTRIAL APPLIANCES
Incorporated
122 East 42nd Street, New York, N. Y.

Thirty-Five Years of Lift-Truck Growth

By T. F. Moriarty

There are many home made devices used in factories and mills that have real merit and when discovered go places. Some of these are not discovered and they remain home made. Others are so good that they come to the attention of people with foresight and they go on to make history.

A clever mechanic connected with a Boston industrial firm had an idea in 1887 and with the help of some steel, lumber and rope made a hand lift truck for use in his plant—to speed up the production job. The device was crude and not at all impressive but it got results. For some reason however very few heard about it and it remained a home made piece of equipment.

In 1910, in Holyoke, Mass., another man had an idea. It was similar to the other and it too resulted in the construction of a hand lift truck for use by the paper converting plant where the man was employed. Herbert W. Cowan was the man and his job was superintendent of the White & Wyckoff Mfg. Co. plant located on the Connecticut River. He turned his idea over to the master mechanic of the plant, George Taylor and within a few weeks Messrs.

Cowan, White and Wyckoff were inspecting with interest the little three-wheel truck that was going to make history.

It was a little smarter looking than the 1887 truck that was born in Boston but that alone was not responsible for the signal success that followed. Probably it was the environment and again it might have been that the truck had more opportunities to make good in an important industry—paper.

A dozen skids resembling the old fashioned wooden sleds were built and paper taken from cases was piled on them. The loads weighed about five hundred pounds. None of the shop men had any trouble hauling these loads over the rough factory floors single handed.

Cowan bothered with the device because he felt he had two important problems to solve. One was saving of time in the handling and rehandling of the paper stock which came to the factory in cases and in rolls. From the raw stock room to the cutting machines, to the rulers, to knives, to binders, to gluers. It was the custom to pick up the paper by hand, put it down on the floor beside the machine and after the machine operation was completed it was picked up from the floor, placed on a four-wheel truck and moved to the next operation. Before that paper got into the packages ready for shipment to customers it had been lifted by hand probably ten to fourteen times. Cowan felt that was too much handling and too much time consumed.

Another item that worried him was that each time the worker picked up a ream or so of paper there was a good chance that the top and bottom sheets would be spoiled—soiled, wrinkled or made dirty by the handling. He thought that wasn't right, probably because he was new in the paper business having transferred from a cotton cloth mill a short time before.

The first truck did so well it was advisable to build five others and before 1910 was ended there were a half dozen little trucks and several hundred skids circulating around the plant. It was estimated that the equipment had reached the goal set. The savings estimated were very large. The truck however was still a device made for use in the White and Wyckoff plant.

Holyoke at the time was referred to in school books as the Paper City of the World. There were probably forty good sized paper mills in the city. Probably no other city had so many paper mills nor did any city make so much paper in the course of a year.

A good number of the mills delivered paper, usually in cases, to Cowan's plant—on horse drawn vehicles. The drivers of the trucks saw the lift trucks in operation and told their bosses about them.

First the boss freight handler went over to the White & Wyckoff plant to see the trucks and skids in use—later the mill superintendent probably with the manager and engineer. There were a lot of visitors to the paper factory to see the Cowan System in use. By that time it had been dignified with the

The modern industrial lift truck has become a versatile utility.

LOOK WHO'S IN THE SADDLE NOW...

Our old friend, John Q. Consumer, has taken the Mikado's place again and he is riding high, wide and handsome. He recognizes the signs of the coming buyers' market—getting tough about it, too.

Instead of begging for tonnage without regard to quality he is beginning to *specify* the qualities he wants in paper and board. And he is getting those qualities from manufacturers whose machines are equipped with Hamilton Felts.

By removing more water at the couch Hamilton Felts permit top speeds for the machines; by delivering stronger, better formed webs they reduce broke; by using less steam at the driers they eliminate the danger of overheating the sheets and making them brittle.

- From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

- **Miami Woolen Mills**

Hamilton Felts

- **Established 1858**

name of System. It was a new method of handling paper and it was efficient because "it eliminated many unnecessary handlings of the stock."

Such well known paper mills as American Writing Paper Co., Whiting Paper Co., Parsons Paper Co., Chemical Paper, Crocker McElwain, Valley Paper Co. and Taylor Logan—all became interested and they "ganged" up on Cowan demanding that he build some of the trucks for them. They were persistent and in 1911 a space was set aside in the White and Wyckoff building for the new firm, Cowan Truck Company. Messrs White and Wyckoff, with their Superintendent Cowan, held the stock of the firm and the lift truck had been patented.

Since the American Writing Paper Co. at the time operated about twenty-two mills in the city and there were eighteen other mills and paper shops there it was some time before the little firm employing a half dozen men was able to satisfy the local requirements. George R. Dickinson, Wauregan, Holyoke, Norman, Riverside, George C. Gill, Mount Tom—these were some of the names under the American Writing Co. that were well known at the time.

Springfield, Westfield, Pittsfield, Lee, Turners Falls and other paper towns heard about the system and they put their O.K. on it. Through 1911 the little truck outfit was rushed to keep pace with the demands. In 1912 there was expansion followed by more growing pains in 1913 and 1914. Then came the boom occasioned by the first World War and that continued through 1918. By that time Cowan was turning out five or six hundred trucks per month.

For the first two years they built two sizes. Model R #1 had a lifting frame 14" wide x 28" long by 4" high and model #2 had a frame of the same width but 38 inches long. The capacities were 1500 and 2000 pounds respectively. The trucks were all metal and equipped with ball bearing wheels. The four inch height was replaced by 6" shortly after the Cowan firm was organized and the paper mills and shops were flooded with these six inch high trucks operating under 6½" clearance skids for a couple of years.

There was then a demand for trucks to handle larger loads and that meant longer and wider frame and it was thought advisable to provide larger wheels —7" in diameter. No. 3R Cowan truck was 3000 pounds capacity and No. 4R was 3500 pounds. The frame on the larger truck was 26" wide by 48" long and it would handle a skid up to 48" wide and 60" long which meant a very large load of paper in 1913 and 1914.

Cowan's paper truck—or actually the system received much publicity in industrial circles and machine shops, electrical plants, wood working shops and food processing plants became interested and bought. All this time Cowan was selling lift trucks and the customers either built their skids or bought them locally—most of them were all wood and some were far from substantial.

Mills and factories found it profitable to store their goods on skid platforms so that when they were to be moved there would be no actual handling of them. The lift truck was rolled under the loaded platform, the handle was pulled forward by the operator and the load was lifted off the floor ready to be moved to any designated point. Contrast that to the old way of pushing an empty truck to the storage area, stooping over and grabbing a bunch of paper with two hands, placing it on the truck, going down for another grab then evening out the stack as the height increased. It took a lot of time to move paper or any other goods that way.

In 1914 a Chicago bookbinder—a man with vision —saw a lift truck in use and bought a Cowan—with two ideas in mind—one was to move his goods and the other was to study the contraption with the idea of going into the truck business. The following year he was in and one year later there were two entries, one established in Cincinnati and the other in Watertown, Mass. Competition proved to be helpful to Cowan after the first effects had worn off and after the four truck firms had poured out their products through the country there were very few progressive mills or factories that weren't using the Lift Truck System in some degree. Also by 1915 the gaspel had spread abroad and a good export business had been built up. During the years of 1915 to 1918 thousands of lift trucks were shipped to France and England for use in the munition plants.

Cowan's lifter trucks were the single stroke mechanical lift type—one stroke on the handle lifted the load to full height. One of the newcomers offered a multi-stroke mechanical lift truck—four to eight strokes to elevate the load to full height—a better job for the heavier loads.

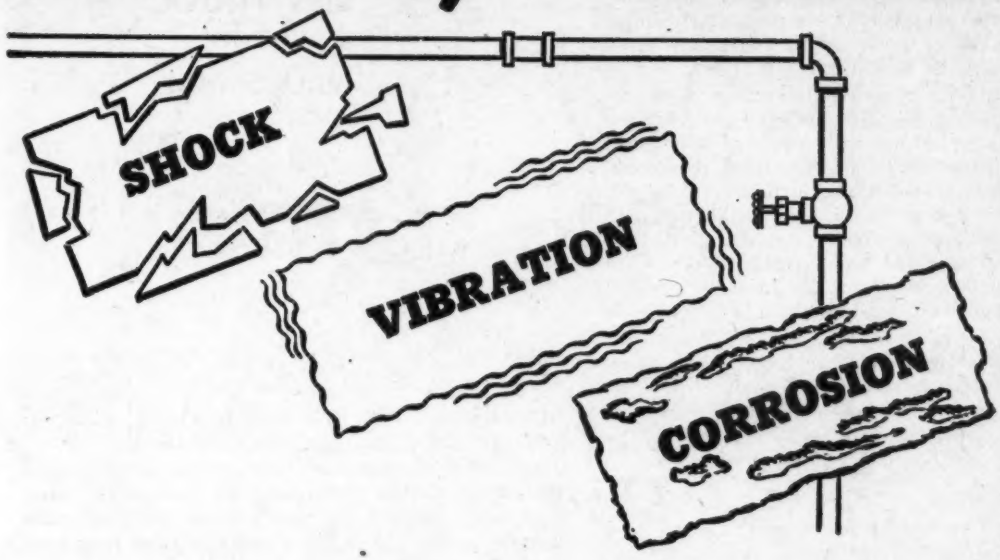
Other truck makers appeared on the scenes in 1915 to 1920, some of them fell by the wayside, later. Old timers in the paper business may remember the Niagara, the Holyoke, the National Chapman, the Miller and the Sturdi which came and went. Also came the Plimpton, Revolvator and the Lyon which stayed on.

From the hand-operated truck—manual lift and manual pull—the lift truck industry jumped to the power truck—electrical lift and electrical propulsion. There had been battery operated load carrier trucks about 1912—you may remember the baggage trucks running about the railroad depots in the big cities. It was no great stunt for the engineers connected with manufacturers of these trucks to design skid lift trucks for those firms whose loads were heavy and whose hauls were long. Many of these big Berthas went into the pulp and paper mills and into the larger paper converting plants. Where he was kept busy one man operating an electric lift truck could do as much work as three or four using hand trucks. Of course the investment was much larger but the manufacturers of the trucks could produce figures that would convince the skeptic that he couldn't afford not to buy the trucks.

As time went on the idea went over among industrial concerns including large paper mills that it wasn't right to waste air space in a plant and that resulted in a growing demand for portable elevators usually called stacking machines. These units were employed as elevators but electric truck manufacturers decided that their trucks could be built, stack and to haul. So soon there were several makes of high lift electric trucks advertised in the trade publications and later they could be seen in the storehouses of the pulp and paper companies. Some firms went in for the stacking idea strong and piled three and four loads high—a risky job in the beginning but nothing out of the ordinary as the manufacturers improved their models.

About 1938 a new wrinkle appeared on the horizon —storing goods on pallets—something like skid platforms without legs. Behind the idea was the possibility of stacking one load higher. Where three skid loads of paper could be stacked that number high a fourth load might be possible because the

End the Triple Menace TO COPPER TUBE AND BRASS PIPE LINES



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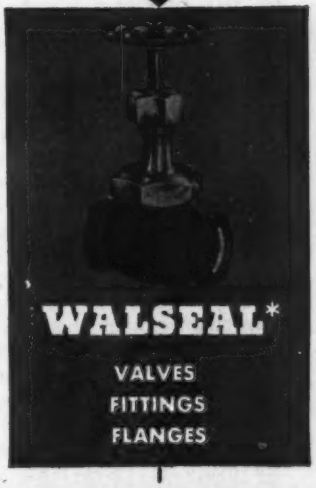
Shock! Vibration! Corrosion! Yes, a Silbraz Joint made with Walseal* valves, fittings and flanges "has what it takes" to overcome this triple threat to copper tube (iron pipe size) and brass pipe lines—and for keeps.

Why? Because patented Walseal valves, fittings and flanges get their *extra* stamina from a ring of silver brazing alloy built right into each port . . . an alloy that when heated with an oxyacetylene torch flows out between the pipe wall and the fitting, making a joint that is stronger than the tube or pipe itself.

In thousands of installations, these Walseal products have proved beyond dispute that they make a "one piece pipe line" . . . a pipe line that does not creep or pull apart under any shock, vibration or temperature to which the copper tube or brass pipe can be safely subjected.

Write today to Dept. 84 for Catalog 42 giving complete data on Walseal products, as well as on the entire Walworth line.



Make it a "one-piece pipe line" with WALSEAL

12 AWARDS TO 4 PLANTS

WALWORTH

valves and fittings

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DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

*Patented – Reg. U.S. Patent Office

lost space under the skid—the clearance ranging from 6½ to 11½ inches—could be done away with.

A second advantage of the palletizing system is that the goods are not likely to be damaged once you eliminate the pressure concentrated on the underneath load thru the four skid legs. The double faced pallet —a unit comprising two decks—is particularly suited for the storing two or more high of goods that would likely be damaged by concentrated pressure.

High-lift platform type electric trucks were redesigned to handle these pallet loads by replacing the solid truck lifting platform with a pair of heavy steel forks that don't bend or break. The truck then could stack and unstack a load up to thirty feet in height, and after lowering close to the floor could haul it to the required destination. There was something else needed—a hand operated pallet truck to take care of the short hauls and to put the loads in position for the electric giants to hoist and haul long distances.

The makers of hand lift trucks were ready and in short time produced single-faced and double-faced pallet trucks—mechanical and hydraulic lift. The double-faced pallet truck is unique in design and operation. It climbs in between the decks of the pallet, rolls the length of it and the wheels drop to the floor thru a space of approximately 7 inches provided at the right location in the lower deck of the pallet. Then the operator thru several strokes of the handle elevates the loaded pallet from the floor.

One of the interesting special jobs designed for the paper industry is the roll handling electric truck. The truck walks up to a big roll of paper grabs it with a vise-like grip and hoists it from the floor then carries it to destination. It's a big time and money saver and in spite of the large investment required it pays for itself in a reasonable time.

A very late development in hand lift trucks is the appearance of the motorized hand model. The first of this type came on the market in 1939 and the inventor, a Cleveland engineer, made over an old Cowan hydraulic hand lift truck. Not much to look at but it did a good job for his firm for a year—another home-made device that made good. The wartime activity created a great demand for this type of truck because it was a further labor saver and the three concerns building motorized lift trucks had only one problem—to produce all the trucks they could sell. Several thousands of these trucks are operating today—a good number in the paper industry. It is expected by many that this truck which is guided by the operator on foot and driven by electric power will be widely adopted in industry and there will be a lessening demand for the full manually operated hand truck.

This newcomer, the motorized model, is considered by many to be a tardy entrant in the materials handling equipment field. The natural development would have been from the "straight" hand truck to the motorized "hand model then to the full powered truck—the truck that gave the operator a ride and did everything except to steer. The explanation for this situation is that demand moved from light duty hand lift trucks to heavy capacity models which required electric power particularly where the hauls were long and that electric propelled trucks—even the non lifting type—were in service even in the early days of the Lift Truck System. It was natural that the manufacturers of these battery operated trucks should respond to the call for battery operated skid lift type.

The present so called motorized hand lift trucks appeal to those firms who have wanted to use electric lift trucks but who have been prevented by limitations in their plants from installing the big fellows. Narrow aisles, weak floors, low capacity elevators will prevent some firms from using the giant electrics but they will find the motorized units suitable and a definite advance over the manual lift and pull hand models.

Hubbs & Howe Opens Erie Branch

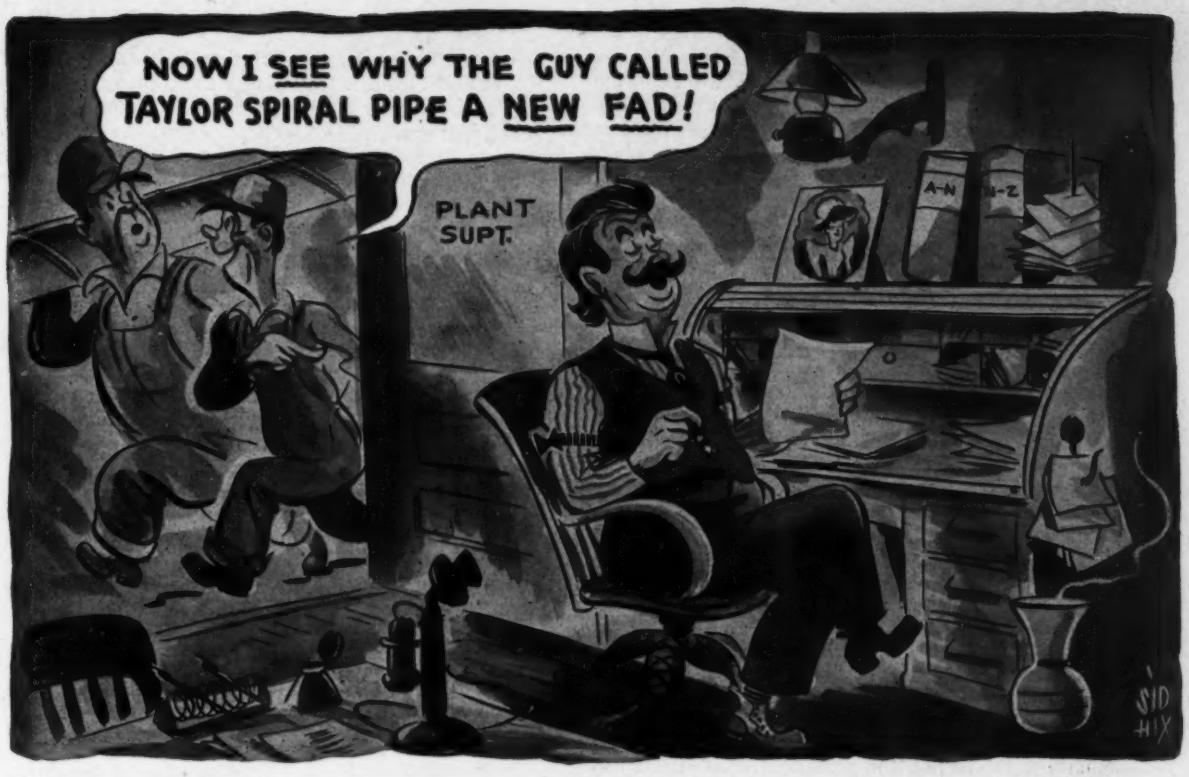
ERIE, Pa., November 20, 1945—Steady expansion of business to the west and southwest of Buffalo has culminated in the establishment of a branch office and warehouse here, by Hubbs & Howe Company of Buffalo, N. Y. and Cleveland, Ohio, now completing its 50th year in the distributing of paper and paper products. The manager of the Erie branch is Donald C. Stroud who was formerly with Kimberly-Clark Corporation. His appointment took effect November 1st and he has under his direction an enlarged staff of trained "paper engineers."

To provide customers throughout northwestern Pennsylvania with full-line facilities of the diversified stocks carried by Hubbs and Howe Co., a warehouse will be opened December 1st, with stocks completed ready for delivery about December 15th. This warehouse is located at 1817-1825 Raspberry St., Erie, Pa. Officers of Hubbs & Howe Co. are Richard C. Kettles, Jr., President; Francis W. Howe, Executive Vice President and Treas.; M. D. Gascon, Vice Pres.; J. R. Hoover, Vice Pres.; H. G. Ihsen, Vice Pres.; M. S. Dilts, Secretary.

Federation Starts Pledge Drive

A record number of pledges was obtained by the Pulp and Paper Division of the Federation of Jewish Philanthropies at its annual dinner on Wednesday, Nov. 14 at the Hotel Biltmore, in behalf of the current $30,000,000 Federation campaign. One hundred leaders were present at the affair, opening an industry-wide drive on behalf of the Federation appeal.

William Mazer of Hudson Pulp and Paper Co., the division's chairman, expressed gratification with the results and predicted that the pace set "would be maintained until the entire industry has been solicited for this historic effort."



It's been a new idea for more than forty years—

We don't want to imply that everyone who uses heavy pipe is living in the past. We simply want to drive home the great truth that a lot of heavy pipe is still being used for services that light-but-strong Taylor Spiral Pipe could handle equally well and at much lower cost.

It has been more than 40 years since Taylor Spiral Pipe was actually a new idea. But while it has been fully proved and increasingly used in every one of those 40 years, its full scope and economy is still a new idea in plants that cling to the old practice of using Standard Thickness Pipe for everything that doesn't call for still heavier pipe.

Remember that the light weight of Taylor Spiral doesn't mean it is a light-duty pipe. Its spiral seam gives it a remarkable strength-to-weight ratio . . . makes it stronger, gauge for gauge, than any other type of pipe . . . enables it to handle the wide range of every-day services like those listed below, with strength and service life to spare.

But the light weight *does* mean economy—in first cost, transportation cost, handling cost, erection cost. In fact, the installed cost of Taylor Spiral Pipe in many cases is scarcely half that of the heavy pipe it so well replaces.

Yes, it will pay you to get away from the heavy-pipe habit. Switching to Taylor Spiral Pipe is made practical by the range of sizes and variety of fittings. Thicknesses range from 12 to 6 gauge; sizes from 6" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge, assuring a complete service and undivided responsibility.

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General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.

CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- White Water Lines
- Pulp Stock Lines
- Paper Stock Lines
- Alkaline Lines
- Size Lines
- Swing Pipe
- Spray Pond Piping

New England Merchants Welcome Scott

BOSTON, Mass., November 12, 1945—With a record attendance of more than 100, an important meeting of the New England Paper Merchants Association, Inc., called at the request of the National Paper Trade Association and addressed by officers of the National Association, was held at the Boston City Club earlier this month. President William H. Walpole, of the New England Association, called the meeting to order, presenting the new regional executive secretary, Norman E. Scott.

Mr. Scott expressed to the members his appreciation of the confidence shown in naming him as their executive secretary, and his thanks for the many individual messages of goodwill received from the membership, as well as from the paper manufacturing fraternity. Mr. Scott outlined the facilities, activities and program of the Association office and urged the members to avail themselves of its advantages.

Arthur H. Chamberlain of the National Association congratulated the New England group on its prospects for increased activity and accomplishment. Assurance was given of the full cooperation and support of every member of the National staff. Detailed information was given as to the next Annual Convention, scheduled in New York City, April 1-3. These dates are considerably later than heretofore and are expected by the National Executive Committee to prove much more satisfactory.

W. G. Leathers, assistant secretary, discussed general conditions in the industry with reference particularly to production and price control as affected by WPB and OPA. Production of items still in limited supply, such as, wrapping kraft, bags, tissues, etc., has improved somewhat but is still inadequate to meet the needs of the trade. Integrated mills are, of course, in a better position than those which are dependent upon other sources for their supply of pulp. In fine papers demand continues heavy and seems likely to exceed any previous records, with the probability that consumption by publishers will be limited only by the available supply.

A feature of the meeting was J. H. Londergan's presentation of the proposal of the NPTA Committee on Simplification of Weights and Standards which involves the use of 1000 sheets of 1000 square inches as the standard unit of measurement.

Boston Trade Holds Rousing Dinner

BOSTON, Mass., November 19, 1945—With the largest attendance ever, approximately 200—and 21 new members elected, a good majority of whom were proposed by President Matthew O. Byrne—and several other interesting highlights, the Fall Meeting and Dinner of the Boston Paper Trade Association in the Roof Ball Room of the Parker House, November 14, was a signal success. As usual, it was an evening of goodfellowship. At the reception from 6 to 7 o'clock, the Philharmonic Trio played lively selections and Phil Claff with the accordion, visiting individual tables, rendered favorite tunes when called for.

After an excellent dinner, President Matthew O. Byrne called the meeting to order, saying that the officers of the Association expressed appreciation and thanks for the big gathering. He extended a welcome to the new members. The president appointed as a nominating committee to report at the March meeting Charles S. Proctor, chairman, John Vivian, Floyd H. Blackman, Harry C. Thayer, and George Olmstead, Jr. Six Victory War Bond prizes were awarded.

Printers Endorse New Paper Standards

WASHINGTON, D. C.—Printing Industry of America, national trade association of the commercial printing industry, has gone on record in favor of a new simplified standard for paper weights and measurements. James R. Brackett, general manager of the association, has informed the United States Bureau of Standards of the action taken by the commercial printers and urged that the Committee on Simplified Practices act quickly on the proposal.

Under the new plan the present different standards for paper measurement would be reduced to one simple basis of 1000 sheets of 1000 square inches. All present sizes and weights of papers could continue to be made, but the amounts of paper would be calculated by reference to a single standard.

Among organizations which have acted favorably on this proposal are the Association of Publication Production Managers, representing the nation's magazines; the Association of Printing House Craftsmen; and the Lithographers National Association.

It is believed by Printing Industry of America that the present time is an ideal one to make the change-over to the new standard. Paper inventories are low and new employes entering the industry can be trained on the new basis.

Starr Joins Cellulose Sales

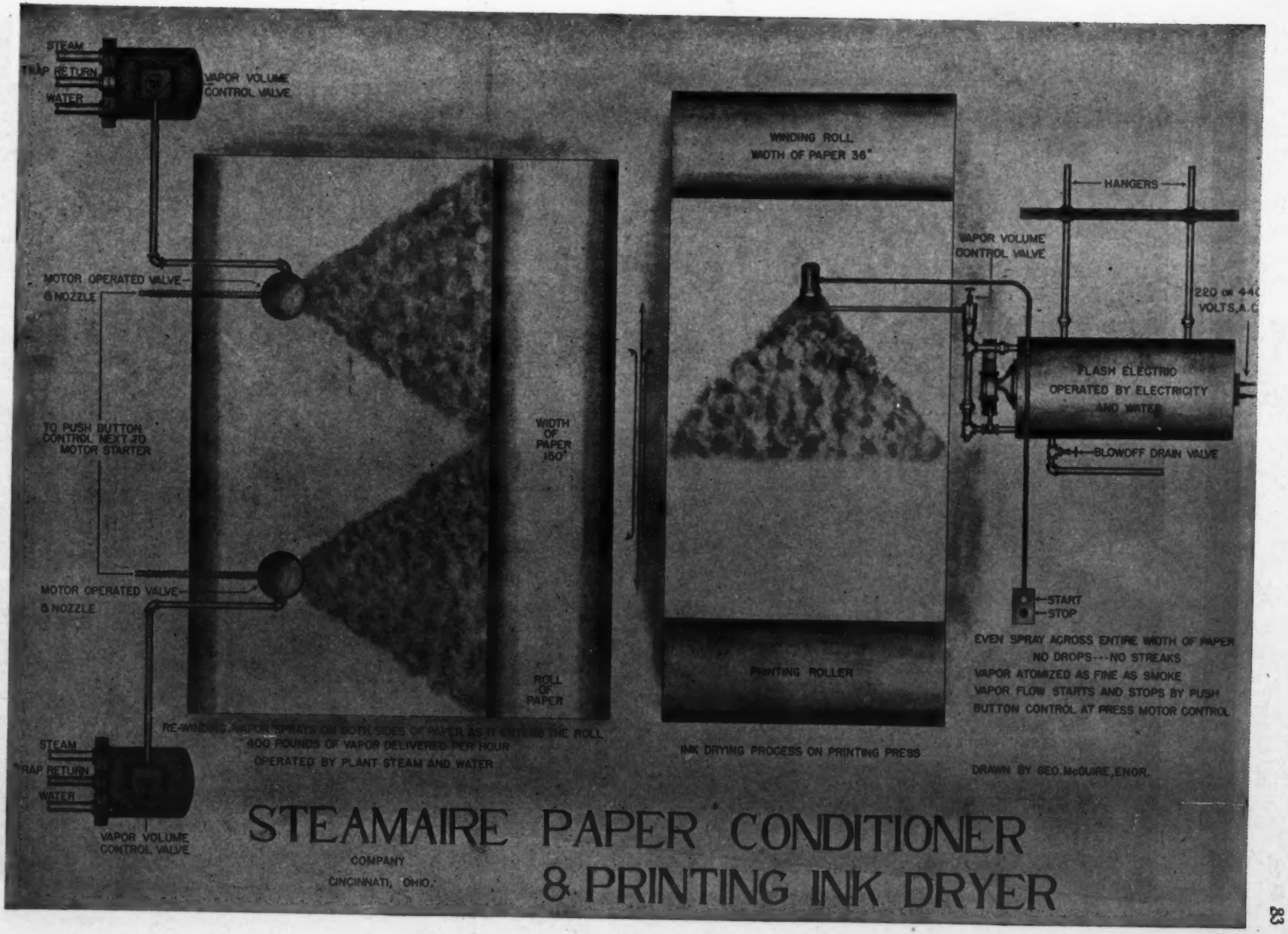
Harrison (Harry) Starr has joined the sales staff of the Cellulose Sales Company, after sixteen months with the Office of Price Administration in Washington, Paper and Paper Products Branch, where he served as head of the Raw Materials Section and also as special assistant to the Price Executive. Mr. Starr has had a long experience in the pulp and paper industry, having for many years been connected with the sales staff of the Brown Company of Berlin, N. H., and later with Atterbury Brothers and Price & Pierce, Ltd., in New York. The Cellulose Sales Company is exclusive sales agent in the U. S. A. for the mills belonging to the Swedish Cellulose Company, having an annual production of more than 800,000 tons of chemical pulp, both bleached and unbleached sulphite and kraft pulp, as well as dissolving and nitration pulps.

Quarter Century Club Dines

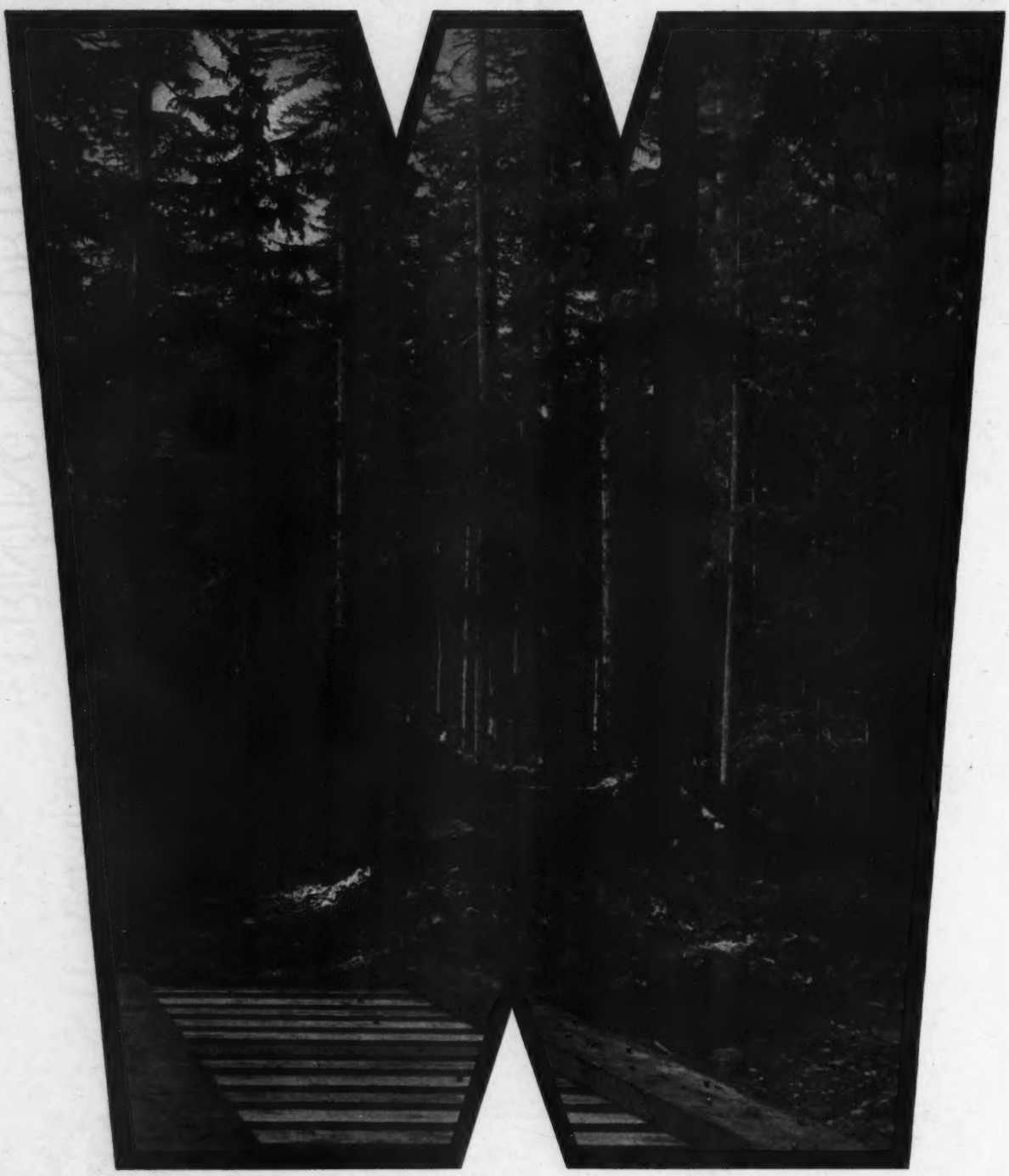
PHILADELPHIA, Pa., November 11, 1945—Members of the Quarter Century Club of The Paper Manufacturers Company were the guests of president Frank A. O'Neill, Jr., and vice-president Louis A. O'Neill, at their second annual dinner, held recently at Adelphia Hotel. Prior to the dinner, a short silence prevailed in honor of the departed members, who now number five. The feature of the evening was the welcoming of two new members, Katherine C. Kryder and John A. Sturgis, who have just completed twenty-five years of service with the company.

Volney Takes Over Williams Plant

BROOKVILLE, Ind., November 12, 1945—The former Williams Felt and Paper Company plant in this city has been acquired by the Volney Felt Mills, Inc., of Chicago. The transaction just completed takes over the plant as of September 15, from the Babbitt-Barber Asphalt Company which had bought it earlier in the year.


STEAM
TRAP RETURN
WATER
VAPOR VOLUME CONTROL VALVE
MOTOR OPERATED VALVE & NOZZLE
TO PUSH BUTTON CONTROL NEXT TO MOTOR STARTER
MOTOR OPERATED VALVE & NOZZLE
WIDTH OF PAPER 180"
ROLL OF PAPER
STEAM
TRAP RETURN
WATER
VAPOR VOLUME CONTROL VALVE
RE-WINDING VAPOR SPRAYS ON BOTH SIDES OF PAPER AS IT ENTERS THE ROLL
400 POUNDS OF VAPOR DELIVERED PER HOUR
OPERATED BY PLANT STEAM AND WATER
WINDING ROLL
WIDTH OF PAPER 36"
PRINTING ROLLER
INK DRYING PROCESS ON PRINTING PRESS
HANGERS
VAPOR VOLUME CONTROL VALVE
220 or 44
VOLTS, A.C.
FLASH ELECTRIC
OPERATED BY ELECTRICITY AND WATER
BLOWOFF DRAIN VALVE
START
STOP
EVEN SPRAY ACROSS ENTIRE WIDTH OF PAPER
NO DROPS---NO STREAKS
VAPOR ATOMIZED AS FINE AS SMOKE
VAPOR FLOW STARTS AND STOPS BY PUSH BUTTON CONTROL AT PRESS MOTOR CONTROL
DRAWN BY GEO. McGUIRE, ENGR.
STEAMAIRE COMPANY
CINCINNATI, OHIO.
STEAMAIRE PAPER CONDITIONER & PRINTING INK DRYER

WEST COAST HEMLOCK PULP



HARVESTING of mature virgin timber for lumber and Weyerhaeuser bleached sulphite pulp requires the planned projection of new track for the logging railroad.

PULP DIVISION ✦ WEYERHAEUSER TIMBER COMPANY

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending November 17, 1945

STOCKS

	High	Low	Last
A. P. W.	9¼	8¾	9
Armstrong Cork Co.	59⅛	57½	58⅛
Celotex Corp.	20	19⅜	19½
Celotex Corp., pf.	20⅛	20⅜	20⅜
Certain-Teed Products Corp.	15	14½	15
Certain-Teed Products Corp., pf.	108½	108½	108½
Champion Paper & Fibre Co.	49½	46½	49½
Champion Paper & Fibre Co., pf.	...	...	...
Congoleum Nairn Co.	35	33½	34⅛
Container Corp. of America	40½	38⅜	40½
Continental-Diamond Fibre Co.	16¼	15½	16
Crown-Zellerbach Co.	30	28½	29⅜
Crown-Zellerbach Co., pf.	111	109	110⅜
Dixie Cup Co.	46⅜	43¾	46⅜
Dixie Cup Co.—A	54½	53	53¾
Flintkote Co.	35½	32⅛	35
Flintkote Co., pf.	110	110	110
Robert Gair	10¼	9⅜	10
Robert Gair, pf.	19⅞	19¼	19¾
International Paper Co.	46¼	42¾	43¾
International Paper Co., pf.	117	113½	114½
Johns-Manville Corp.	145	142	145
Johns-Manville Corp., pf.	133	131½	132½
Kimberly-Clark Corp.	59¾	59½	59¾
Mac Andrews & Forbes	35	35	35
Mac Andrews & Forbes, pf.	154½	153½	154½
Masonite Corp.	58¾	53	58¾
Mead Corp.	21⅜	20¾	21¼
Mead Corp., pf. A—6%	108	108	108
Mead Corp., pf. B—5½%	107	106	106
National Container Corp.	28⅛	25½	26
Paraffine Companies, Inc.	77½	76½	77⅛
Paraffine Companies, Inc., pf.	110	108⅛	110
Rayonier, Inc.	24½	23	23
Rayonier, Inc., pf.	37⅞	37½	37½
Ruberoid Co.	47	46	46
Scott Paper Co.	60⅝	59	59
Scott Paper Co., pf.	110½	110½	110½
Sutherland Paper Co.	40	39⅛	40
Union Bag & Paper Corp.	25⅛	24½	25
United Paperboard Co.	10⅝	9¼	10¼
U. S. Gypsum Co.	104¾	102	103
U. S. Gypsum Co., pf.	...	...	...
West Virginia Pulp & Paper Co.	35⅞	34⅛	35⅞
West Virginia Pulp & Paper Co., pf.	112½	111½	112½

BONDS

Abitibi Pulp & Paper Co. 5s '53	111	110¼	111
Celotex Corp. 3¼s '55	...	...	...
Certain-Teed Products Corp. 5½s '53	...	...	...
Champion Paper & Fibre Co. 3s '65	...	...	...
International Paper Co. 6s '55	108	107½	107½
International Paper Co. 5s '47	103¾	102⅞	102⅞
Mead Corp. 3½s '53	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending November 17, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	45	44	44¾
Hummel-Ross Fibre Corp.	13	12	12¼
St. Regis Paper Co.	10¾	10⅝	10¾
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	9⅛	8⅞	9⅛

BONDS

American Writing Paper Co. 6s '61	102	101¼	102

I. P. Co. Calls Bonds

The International Paper Company has called all its $22,650,000 first lien and general mortgage bonds, 3⅝% series due 1956, for payment on December 10, 1945, at 103 and accrued interest. Funds for this purpose have been obtained from 2% bank loans aggregating $22,650,000 from The Chase National Bank, Bankers Trust Company, and The First National Bank of Boston, payable in equal semi-annual installments over a ten year period.

Albermarle Nets $5.18

The Albemarle Paper Manufacturing Company for the twenty-four weeks to September 16 reports net income of $78,290, or $5.18 a common share, against $93,317 earned in the 1944 period; net sales, $2,529,662, against $2,476,114.

Puget Sound Profits Off

Net profit from operations of Puget Sound Pulp & Timber Co. during the first nine months of 1945 amounted to $326,585, after $423,883 for Federal taxes, comparing with a profit of $349,101, after $421,587 for taxes, in the corresponding period of 1944. Including non-recurring net capital gains of $193,094 this year and $509,067 last year, total net income for the nine month periods was $519,679 in 1945 and $858,168 in 1944.

Operating profit after provision for preferred dividends was equal to 84 cents a share for the first nine months of 1945, against 91 cents a year previous. Including non-recurring capital gains, net per common share amounted to $1.43 in the first nine months of 1945, and to $2.47 in the like period of a year ago.

Pulp production, January through September, amounted to 67,304 tons in 1945 and 75,694 tons in 1944. Net sales and other revenue totaled $3,825,519 in the 1945 period and $3,676,659 in 1944. Profit before Federal taxes amounted to $759,468 in the first nine months this year and $770,688 last year.

A. N. P. A. Reports on Newsprint Stocks

Daily newspapers reporting to the American Newspaper Publishers Association show that stocks of newsprint paper on hand were 40 days' supply at the end of October 1945 which show a decrease of 4 days' supply under the amount on hand at the end of September 1945. This 40 days' supply at the end of October 1945 compares with 54 days at the end of October 1944; 53 days at the end of October 1943; 65 days at the end of October 1942, and 45 days at the end of October 1941.

Daily newspapers reporting to the ANPA consumed 236,939 tons of newsprint paper in October 1945, compared with 218,137 tons in 1944 and 262,488 tons in 1941. This was an increase in October 1945 over October 1944 of 8.6% and a decrease under October 1941 of 9.7%. The year 1941 is the base for calculating allowable use by newspapers under WPB Order L-240 which is to end on December 31.

The total estimated newsprint consumption in the United States for October 1945 was 338,484 tons which includes all kinds of uses of newsprint paper. For the first ten months of 1945 it was estimated to be 2,848,069 tons.

During the first ten months of 1945 the reporting newspapers used 1,993,648 tons of newsprint, an increase of 3.1% over the first ten months of 1944 and a decrease of 17.2% under the first ten months of 1941.

International Earns Less

The International Paper Company reports for the three months ended September 30, 1945, a net profit of $1,810,405, and for the nine months, a net profit of $6,221,476. This compares with a net profit of $2,114,376 for the like three-month period in 1944, and with $6,548,626 for the nine months ended September 30, 1944.

Continental Diamond Nets $300,231

The Continental-Diamond Fibre Company and wholly owned domestic subsidiaries for nine months, reports a net income of $300,231, compared with $280,111 earned in last year's period.

Kimberly-Clark Starts Addition

(Continued from page 58)

Other members of the executive committee for 1946 are O. K. Ferry, Menasha; Walter Fredlund, Appleton; George Runde, Neenah, and Connie Brossel, Neenah.

About 200 members of the club attended the ninth annual meeting and dinner of the club Tuesday evening, November 13, at the Conway hotel, Appleton, Frank O. Holt, director of public relations at the University of Wisconsin, was the principal speaker.

Paper Concerns Give Land to City

Seven parcels of land have been added to previous gifts by the Ahdawagam Paper Products Company and the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., to the city for its East side business district beautification and modernization project. The firms indicated that two more would be forthcoming as soon as legal details have been cleared up.

A Consolidated spokesman indicated that the company would, if asked, lend assistance in the construction of a new hotel to replace the Witter, which is destined to be razed along with the rest of the structures.

Explains Fox-Wolf River Control

Fred G. Wilson, state superintendent of forestry at Madison, Wis., explained last week that two "practical" approaches can be taken by the newly-organized Fox-Wolf River Control Association. He represented the commission at a meeting of the association in Appleton, Wis.

He told the commission that the winter draw-down of Lake Winnebago could be managed more accurately by taking snow surveys each winter to measure the probable intake during the spring. He also declared feasible the often-advanced proposal to divert water from the Wisconsin river at Portage to the Fox river in order to increase the Fox river flow in the industrial section during periods of low water. The commission will take no stand until the association advances some definite proposals.

Nekoosa-Edwards Donates Land

The Wisconsin Rapid, Wis., council was told at a meeting last week that the Tri-City airport could be purchased for $40,000, with the Nekoosa-Edwards Paper Company, Nekoosa and Port Edwards, Wis., donating 256 acres of land to allow for future expansion and that an option had been secured on another necessary 40 acres.

New Bank Director

R. J. Cullen, chairman of the International Paper Company, has been elected a director of the Bank of Toronto. Mr. Cullen is also a director of the Canadian International Company and the New Brunswick International Paper Company.

Maine Seaboard Buys Generator

BUCKSPORT, Me., November 13, 1945—The proposed sale of a 5,000-kilowatt steam turbogenerator to the Maine Seaboard Company, has been sanctioned by the Securities Exchange Commission. The turbogenerator is being sold by the Central Maine Power Company at a cost of $200,000.

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Compounding Stability of GR-S Latex

by RALPH T. NAZZARO*

The compounding of natural Hevea latex developed auspiciously in this country through the tireless efforts of several notable rubber companies. Many hundreds of uses can be listed for natural latex, each requiring a sligthly different formulation. Yet, despite the tremendous progress in latex technology as evidenced by usage alone, a state of artisanism existed in the compounding of latex prior to the war. The shortage and the eventual elimination of latex as a contending article of commerce stimulated researches and developments into the fields of synthetic elastomers. It was soon found that the colloidal behavior of these new materials was essentially different from that of the very versatile natural product, requiring a more fundamental interpretation of compounding techniques.

The natural protective colloids of Hevea afforded the user a considerable degree of freedom in compounding, but all this is lacking in GR-S latex, taking it as a typical example of a synthetic latex. Responding rapidly to changes in pH, the stability of the synthetic latex is easily affected by increasing concentration of electrolytes. Any salt can be used to precipitate the colloidally dispersed polymer provided that the maximum concentration for that particular salt has been reached. Concentrations, therefore, are the significant factor in the compounding of the new latices for stability with little, if any freedom for compounding prejudice.

Not only is the Schultz-Harvey valence rule generally applicable to the coagulation of the latex, but also of paramount importance is the type of salt and its products of hydrolysis. For example, Mg Cl_2 is a better coagulant for GR-S latex than KCl, but NH_4 Cl will cause the latex to flocculate at smaller concentrations than KCl, although both NH_4 Cl and KCl, according to the Schultz-Harvey Rule, yield monovalent ions. A comparison of the salt stability of Type III GR-S latex is given in Table I.

TABLE I: SALT STABILITY OF GR-S LATEX TYPE III

Salt	Concentration to Coagulate Latex
1. $(NH_4)_2SO_4$	0.026 M
2. $(CH_3COO)_2Zn$	0.020 M
3. CH_3COONH_4	0.025 M
4. C_6H_5COOH	2.230 M
5. Zinc Ammonia Salicylate	0.020 M
6. Zinc Ammonia Acetate	0.016 M
7. Zinc Ammonia Hydroxide	0.016 M
8. Zinc Ammonia Sulfate	0.009 M
9. Zinc Ammonia Chloride	0.009 M
10. Zinc Ammonia Carbonate	0.032 M
11. $(NH_4)_2CO_3$	0.180 M
12. NH_4HCO_3	< 0.180 M
13. Sodium Silicate N Brand	0.830 M
14. Na_3PO_4	0.130 M
15. NaCl	0.210 M
16. NaOH	0.165 M

Of the lyophilic colloids such as casein, glue, gelatin, starch, egg albumen, the solvated casein gave the best general stabilizing effects, although gelatin and egg albumen appeared to impart better specific stability against zinc salts. Glue, gelatin, and egg albumen caused very rapid and pronounced thickening of the latex. Ammoniated casein caused a slight increase in viscosity, but its protective action against the usual electrolytes was less influential than gelatin or egg albumen.

* Vice-President, Agawam Chemicals, Inc., West Springfield, Mass.

The stabilizing efficiencies of the sodium salts of fatty acids can be based practically entirely upon a stoichiometric relationship between the sodium ion and the coagulating ion, and about the same general conclusions can be drawn with some slight modification due to the size of the anion for sodium salts of alkyl aryl sulfonic acids. Naturally the character of the anion and the quality used of each agent will alter somewhat any general statement but maintaining the stabilizing agent within reasonable and usable concentrations up to 2% on the rubber, it was found that the latex assumed, more or less, the electrolytic properties of a dilute solution of the particular agent used.

The rules or tendencies of ionic adsorption from solution seem to explain empirically, at least, some expected irregularity in the behavior of lyophilic colloids as protective agents for latex.

An interesting development regarding the stability of latex has come from an investigation into the effects of small concentrations of lyophilic colloids such as albumen, gelatin, saponin, etc., on the quantity of salt necessary for coagulating the latex. It has been the general impression in the latex industry that lyophilic colloids aid in the protection of the dispersed phase from the influence of coagulating agents. This statement is fundamentally true down to a pre-determined minimum concentration, but it is found not to hold generally in very small concentrations of the lyophilic colloids.

According to Freundlich, lyophobic colloids can be sensitized by the use of small concentrations of certain lyophilic colloids. Sensitization in this condition actually refers to a diminishing amount of electrolyte necessary to coagulate the latex. The amount and type of lyophilic sol necessary to sensitize is dependent upon the particular interfacial conditions of the latex and, for each lyophilic body there is a maximum concentration beyond which the entire lyophobic system begins to approximate the electrokinetic properties of the particular lyophilic colloids. At a proper concentration the lyophilic sol is adsorbed irregularly between the lyophobic particles and the outer dispersion medium. It is reported that if the lyophilic sol is non-selective in its activity, it is adsorbed as above without effecting any appreciable change in the electrokinetic properties of the particle and apparently assumes the state of the fixed layer itself.

The following lyophilic agents were prepared at 10% concentration by weight and preserved with 0.01% Dowicide A.

1. Citrus Pectin
2. Gum Arabic
3. Saponin
4. Albumen
5. Gelatin
6. Bacto-peptone

One percent of each lyophilic colloid based on the rubber content (dry) was added to a formulation No. PP-103B which had been previously stabilized with 1% AGCHEM SA-9. The sensitivity of the stabilized latex varied with the exact colloid added in the compounding, as tabulated below in Table II. The

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~~***NEW PROCESSES***~~... none to learn in using UFORMITE 467 — and no aging or pretreatment of the resin is needed.

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~~***SPECIAL CATALYST***~~ . . . no need for one with UFORMITE 467. Only alum is required for beater treatment with resin.

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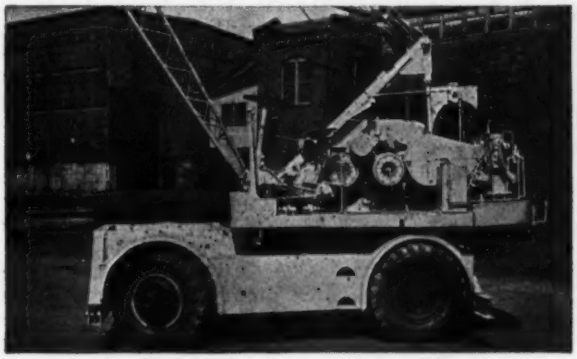

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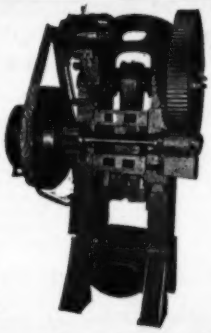

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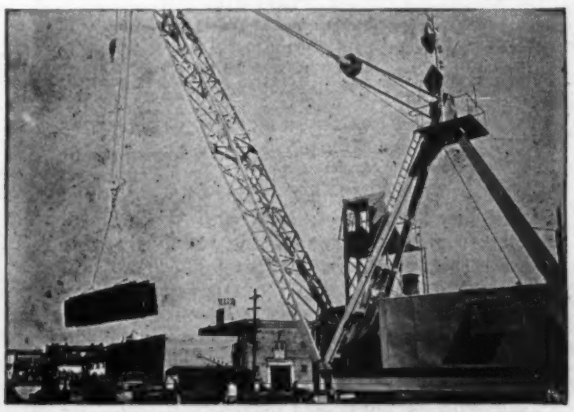

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molar concentration of ammonium sulphate present in the latex at the time of flocculation is indicated.

TABLE II

	$(NH_4)_2SO_4$ (Moles per liter)
1. Citrus Pectin	0.176
2. Gum Arabic	0.145
3. Saponin	0.124
4. Albumen	0.0825
5. Gelatin	0.134
6. Bacto-peptone	0.176
7. Stabilized Latex GR-S (Type III)	0.207
8. Raw GR-S Latex (Type III)	0.026

The above table also illustrates the effect of stabilization by AGCHEM SA-9 which is one of a whole series of alkylolamine-fatty acids condensation products. Four of these compounds have been prepared commercially and are numbered as AGCHEM SA-9, 10, 11 and 12 for the sake of identification. They are all essentially transparent and amber in color, and vary from viscous liquids to semi-solids. They are soluble in hot or cold water and their solutions are stable to both acid and alkali.

Table III will illustrate the surface activity of AGCHEM stabilizers at an air-liquid interface.

TABLE III

Surface Tension of Aqueous Solutions at 24° C.

Type of Stabilizer	Concentration of Stabilizer in Distilled Water (dynes/cm.) 0.1%	1%	3%	Distilled Water
AGCHEM SA-9	29.4	29.6	30.2	
AGCHEM SA-10	31.2	31.4	31.8	72.3
AGCHEM SA-11	31.6	31.8	32.5	
AGCHEM SA-12	35.9	36.2	36.2	

The value of AGCHEM SA-9 as a stabilizing agent against the influence of an electrolyte has been discussed above in connection with small concentrations of lyophilic colloids. Utilizing a compound containing only 2% AGCHEM SA stabilizer based on the dry solids content of the latex and standardizing the compound at 33% solids, it was found that the electrolytic stability of the stabilized latex was by far superior to the unstabilized latex. This is indicated in tabular form below.

TABLE IV

Coagulating Concentrations of Different Salts (moles/liter)

Latex Compound	CH_3COONa	$BaCl_2$	$MgCl_2$	$MgSO_4$	$FeCl_3$	$AlCl_3$
Unstabilized	0.0501*	0.0392*	0.0248*	0.0459*	0.0133*	0.0108*
AGCHEM SA-9		0.0780	0.0429	0.0627	0.0313**	0.0192*
AGCHEM SA-10		0.0774	0.0429	0.0588	0.0296**	0.0187**
AGCHEM SA-11		0.0780	0.0429	0.0647	0.0254**	0.0226**
AGCHEM SA-12	0.4120	0.0836	0.0596	0.1336	0.0233	0.0258**

* Gelation will occur at lower concentrations upon storage.
** Coagulation incomplete.

The AGCHEM SA series show complete compatibility with latex and with the film deposited therefrom. Solutions of the stabilizers have a pH value between 9.3 to 9.7 and hence no appreciable change on the final pH of the stabilized latex has been observed. The viscosity effects on the latex have been found to be no greater than the addition of an equivalent volume of water. There is evidence to believe that the stabilizers have a beneficial effect on the aging of the rubber deposited although no special anti-oxidant properties have been attributed to them. Specific gravity determinations at 25°C are listed as follows:

AGCHEM SA-9	1.02
AGCHEM SA-10	1.02
AGCHEM SA-11	1.026
AGCHEM SA-12	1.05

AGCHEM SA stabilizers retain their identity and stability in the presence of common electrolyte solutions. Table V lists a number of the mixtures made for laboratory examination. Ten percent by weight solutions of the salt listed were added to 10ml of 1% solutions of the stabilizers sufficient to make 100ml total volume. These mixtures or compounds were permitted to stand 24 hours and the results examined.

TABLE V

Compatibility

Salt Solution	#9	#10	#11	#12
NaCl	cloudy	cloudy	clear	clear
$AlCl_3$	clear	clear	clear	clear
$ZnCl_2$	cloudy	cloudy	clear	clear
$(NH_4)_2SO_4$	sl. cloudy	sl. cloudy	clear	clear
NH_4Cl	clear	clear	clear	clear
$(CH_3COO)_2Pb$	cloudy	cloudy	clear	clear
$AgNO_3$	ppte	ppte	discolored	clear
Na_2SO_4	cloudy	cloudy	clear	clear
$MgSO_4$	cloudy	cloudy	clear	clear
$BaCl_2$	cloudy	cloudy	sl. cloudy	clear
$FeCl_3$	clear	clear	clear	clear

The compounding of latex with zinc oxide has always presented a problem in stability and more particularly with GR-S, Neoprene and Hycar latices. In the absence of any AGCHEM stabilizer flocculation of the dispersed phase occurred within ¾ of an hour, and as the zinc oxide content was decreased a corresponding increase in stability time was noted. In the presence of 1% AGCHEM SA-9 the same compounds were stable without flocculation for a considerably longer period of time.

In order to disperse the AGCHEM SA-9 in the latex it was recommended procedure to dilute the concentrate to 10% by weight and then permit the admixture to stand for about 60 minutes before compounding with zinc oxide. Table VI illustrates the comparison between the unstabilized latex and the stabilized latex with respect to the effects of a soluble zinc ion on the GR-S, Type III Latex. The stability time given in hours relates to the point at which flocculation of the latex sets in.

TABLE VI.—ZINC OXIDE COMPOUNDED GR-S LATEX TYPE III

Wt. ZnO on 100 Dry Rubber	Stability Time: Unstabilized Latex	Stabilized Latex
4.17	¾	>1200
2.34	1½	>2400
1.70	3	>2400
1.26	3	Indefinite
1.15	3½	Indefinite
0.98	5	Indefinite
0.74	8	Indefinite

The alkylolamine-fatty acids condensation products have been examined for other uses besides their stabilizing effect upon latices and emulsions and these include such special effects as dispersing aids, plasticizing of cellulosic fibers, as emulsifying agents, etc., where their excellent stability over a wide range of pH and their rapid adjustment to interfaces make them especially applicable in an easy processing manner.

The experimental work for this preliminary report was started at a time when the writer was a Fellow at the Mellon Institute of Industrial Research, Pittsburgh, Pa., and therefore, wishes to express his appreciation for the use of their facilities and also for the assistance of Mr. George G. Nahay who ably prepared some of the experimental formulations.

Wage Ruling Upheld

The National War Labor Board announces that it has upheld a decision of the Quebec Regional Board granting a 4 cents an hour increase in the pay of all employees of sawmills of Price Brothers and Company at Rimouski, Priceville, and Matane, P. Q. The National Board found that a bonus plan, providing an incentive bonus to certain employees of the company, had been "authorized and not directed."

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- Sodium Sulfide
- Sodium Hyposulfite
- Sodium Sulfite (Anhydrous)
- Sodium Bisulfite (Solution or Anhydrous)
- Disodium Phosphate
- Trisodium Phosphate
- Tetrasodium Pyrophosphate
- Sulfuric Acid
- Nitre Cake (Sodium Bisulfate)
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40 RECTOR STREET, NEW YORK 6, N. Y.

Sales and Technical Service Offices: Atlanta • Baltimore • Boston • Bridgeport (Conn.) Buffalo • Charlotte (N. C.) • Chicago • Cleveland • Denver • Detroit • Houston • Kansas City • Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh • Providence (R. I.) San Francisco • Seattle • St. Louis • Utica (N. Y.) • Wenatchee • Yakima (Wash.)
In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis.
In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

● Until recent years, the regular use of linter cotton for paper making remained an unrealized dream.

The increasing need of an additional and stable source of fiber for the manufacture of cotton content paper was foreseen by Railway Supply Company. RAYCO research and laboratory technicians gave concentrated study to the task of finding the best methods for using RAYCO Linter Cotton in fine paper making. Paper mills cooperated, and the RAYCO-developed techniques were proven in mill production runs.

Today an increasingly large number of leading paper mills are regular users of RAYCO Linter Cotton. RAYCO reaches them clean, uniform in quality, carefully graded, ready for the cooker. All rag room operations are eliminated, cooking time is reduced, and uniform quality of the finished paper is maintained.

RAYCO specialists will gladly help you adapt this high-quality linter cotton to your individual mill process. Your inquiry will receive prompt attention.

The RAILWAY SUPPLY & MFG. CO. and Affiliates

Specialists in Grading, Marketing and Processing Cotton Fibers

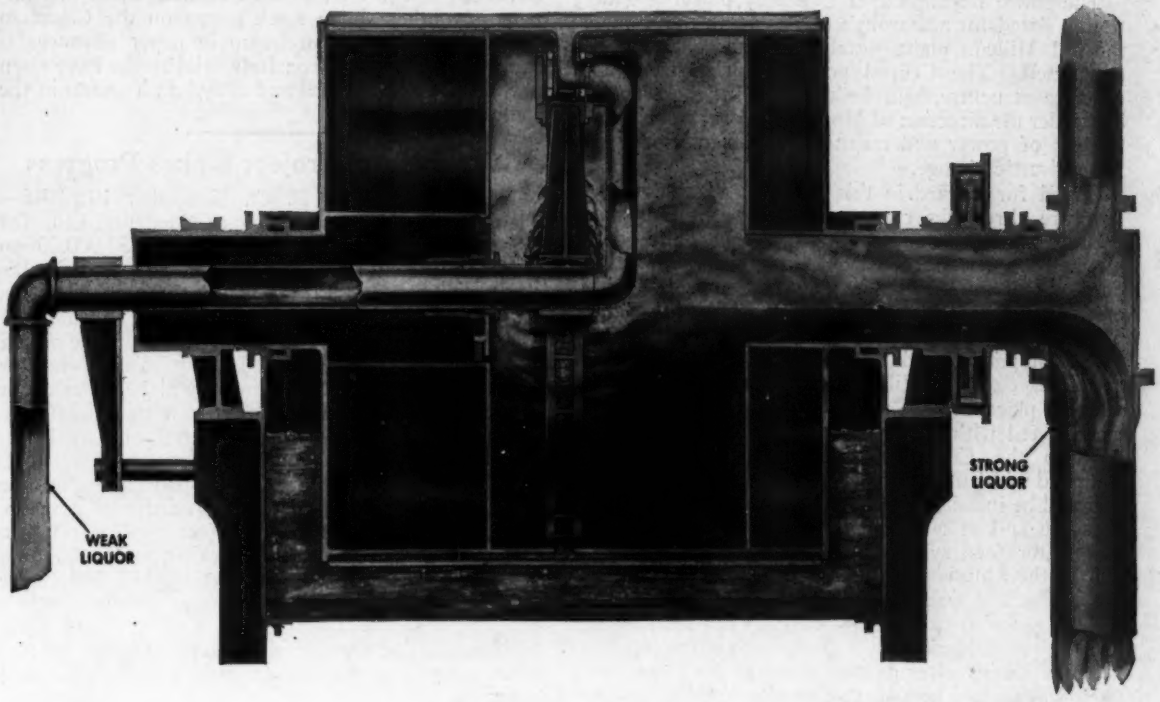
General Offices: Cincinnati, Ohio

Plants and Sales Offices:

Cincinnati, Ohio	Charlotte, N. C.	New York, N. Y.
Franklin, Ohio	Covington, Tenn.	Chicago, Ill.
Atlanta, Ga.	Greensboro, N. C.	Detroit, Mich.

RAYCO LINTER COTTON

OLIVER *Ringvalve* FILTER



■■■ **38** already in operation as kraft or bleached stock washers and deckers.

■■■ **7** companies already have placed repeat orders.

Send for Folder F-106 for further details.

The basic soundness of design and evident superiority in operational advantages appealed originally to these buyers of the "Ringvalve" Filter. But the real "proof of the pudding" has been well-expressed in the repeat orders from seven of the companies after operating their original units for many months, some well over a year.

The Oliver Ringvalve Filter is a capital investment as are all Oliver filters for pulp and paper. It stands to reason that no company is "*repeating*" its order for the Oliver Ringvalve Filter if not convinced by its own experience of the economical and operational superiority of the Ringvalve.

You should check its value for any of the following services in your mill: black liquor washing, bleach washing, deckering, decker-washing, high density thickening. You should look into its advantages for counter-current washing of kraft stock.

A call or letter to our nearest office will be given prompt attention.

OLIVER UNITED FILTERS INC.

New York 18, N. Y.
33 West 42nd Street
San Francisco 11, California

Canada: Sales & Manufacturing Representative
E. Long Limited
Orillia, Canada

Chicago 1, Illinois
221 N. LaSalle Street

Western Sales Division
Oakland 1, California
2900 Glascock Street

Factories: Oakland, Calif. — Hazleton, Pa. — Orillia, Canada — Melbourne, Australia

Bryant Starts Work on Power Plant

KALAMAZOO, Mich., November 11, 1945—The Bryant Paper Company Saturday announced improvements under way at its power plant that will run up toward $1,000,000. Work already has been started on the project.

The entire Bryant Paper Company power production is slated for a thorough revision. In the process the old Milham plant, nearly 35 years old, will be eliminated. The Central power plant, a well-built concrete structure, will be changed little externally but under the direction of Morton S. Fogerty, superintendent of power and maintenance, its interior is in for a drastic change.

Slated for discard in this program of modernization are three big cross compound steam engines with their huge belts, spinning governors, and enormous flywheels—once efficient in power production operation of a generation ago, but now hopelessly outmoded. One of them handled the equipment in the Milham beater room, the second the Bryant beater room equipment, and the third drove the constant speed shaft of two Milham paper machines.

Their places will be taken by new individual drive motors, fed with power from the new equipment to go into the Central power plant. Two boilers equipped with automatic fuel feeds burning pulverized coal will be installed. They will operate at 625 pound pressure and at a temperature of 750 degrees. A new water feed system and new boiler feed pumps will be their auxiliary equipment.

In Central's turbine room a 5,000 kilowatt steam turbine-generator will be installed next to the present 1,000 kilowatt generator. Steam not extracted for use in the mills after passing through the steam turbines will go to a new surface condenser—thus maintaining a perfect balance between the demand for steam and the demand for electric power at all times. The new switchboard to accommodate the generators will be installed on the east side of the turbine room.

Complete centralization of power and steam development at the Bryant Paper Company will be accomplished with consequent efficiency of operation, the plant officials report.

CANADA SCANS CARTELS

(Continued from page 64)

for Canadian mills while European markets, other than United Kingdom, would be accepted as Scankraft territory. In the United Kingdom Canadian mills were to be permitted to make shipments up to certain agreed tonnages at prices uniform with those quoted by Scankraft."

The Red Rock mill of Brampton Pulp & Paper Co., has just started pulp production, but is not yet making paper. The 15,000 cords of pulpwood left at East Angus after the recent disastrous fire, will permit production at East Angus for several weeks, and to the extent that additional pulpwood can be purchased, there may be some further output, but not much production at East Angus can be expected until the coming season's wood cut can be delivered. In Red Rock operations, revenues must first be applied to meeting obligations incurred in construction of the new mill, and thus profits that can be available for the common stock will be limited at the start. It is possible some tax adjustment can be worked out, but, meanwhile, earnings outlook for Brompton—and St. Lawrence Corp., the parent company—is dubious for this year.

Recent activity and buying in St. Lawrence Corp. stock, has been attributed in brokerage circles largely to U. S. demand. The stock is widely distributed and the recent buying has been accompanied by unconfirmed speculation as to possibility of new interests seeking control.

In six months after V-E Day paper stocks have advanced 47.5% on the stock exchanges, to far outpace any other single stock group on the Canadian exchanges. The current let-up in paper advances is said to be only corrective. Industrial stocks have risen only 21.2% at Montreal and 20.8% at Toronto in the same period.

Westminster Project Makes Progress

New Westminster, B. C., November 19, 1945—Plans of the Westminster Paper Company, Ltd., for the expenditure of approximately $1,250,000.00 on plant expansion and improvement are now in the construction stage. Provision has been made for a new and larger wharf 56 feet by 275 feet and the bulkheading of the entire river frontage. The wharf will incorporate a five-ton Barlow marine elevator and gasoline-powered lift trucks will be utilized for efficient mechanical handling of raw materials from water-borne carriers to storage zone and finally to place of consumption.

Building plans provide for construction, on the four acres recently acquired, of a reinforced concrete and steel fireproof building 85 feet by 225 feet, two stories, to house the paper machine, and a building of similar construction 126 feet by 112 feet, three stories, to provide additional room for converting paper products and storage of same. A new office building will be erected, which will leave the present office space available for modern locker rooms and cafeteria.

Equipment presently on order for the programme includes a 132-inch wide Beloit Iron Works Yankee design Paper Machine of the latest and most efficient type. Stock preparation equipment is being manufactured by Alexander Fleck Limited of Ottawa and will consist of their latest type Hydrapulper and Hydrafiner systems which have been brought to perfection during the war years. Converting equipment to be installed will handle the output of the new paper machine, and will provide additions as well for the present plant. A third hog fuel burning boiler will be installed to provide the additional steam requirements needed. A new filtering plant will be erected on the recently acquired property to further purify the water in the paper-making process. The latest and most modern types of conveying equipment and labor-saving devices are being provided throughout. The plant will be completely electrified.

At the present time the new wharf is completed, installation of the Barlow elevator is proceeding, and excavating for the new machine room building is under way. The earth for fill behind the bulkhead along the waterfront has been provided by the widening of 5th Avenue adjacent to the Company's property and from excavating for the building foundations.

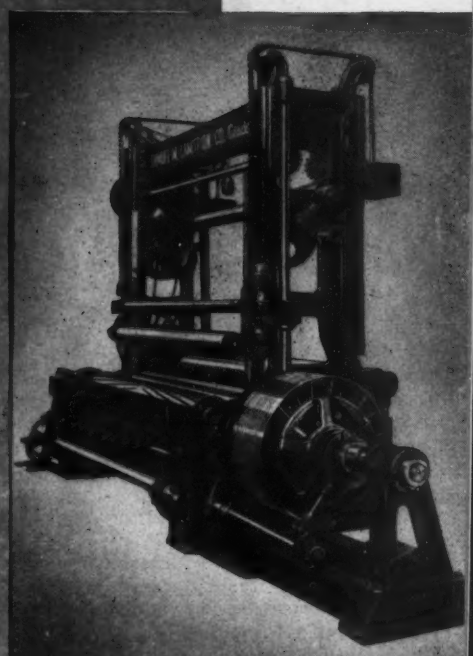
The completion of the new programme will mean an increase of employees from 220 to 325, and the productive capacity of the plant will be doubled. The company presently manufactures toilet paper, paper napkins, paper towels, sanitary napkins, plain and printed fruitwraps, wax paper including printed and plain breadwraps. When the new programme is completed, cellulose and facial tissues will also be produced.

SUCCESSFUL COMBINATIONS

The **MORTISE** *and* **TENON**

BIRD
NEPONSET
PRODUCTS

TRADE MARK
REG. U.S. PAT. OFF.



Bird & Son, inc., makers of asphalt roofing and siding, enamel surface floor coverings, fibre cases, shoe cartons, box boards and special papers, use Langston Slitters in some of these processes. Another example of successfully combining efficient machinery and management.

The Type DA Langston illustrated, is made to handle the widest rolls of maximum diameter at high speeds. Regardless of width, every cut is true and clean.

SAMUEL M. LANGSTON COMPANY, *Camden, N. J.*

LANGSTON *Slitters and Roll Winders*

Hansson Expands Machinery Department

Elof Hansson Inc. at 220 East 42nd Street, New York City, has expanded its machinery department, according to Karl E. Sundqvist, treasurer and manager of that department. The staff has been increased by James Dillin, formerly with Balfour Guthrie & Co. Ltd., who is acting as assistant manager of the department. In connection with this expansion, Mr. Sundqvist declares that:

"American-made paper and pulp mill machines will be in great demand in all paper and pulp countries in the world for many years to come. Not only is

KARL E. SUNDQVIST

the quality of machinery made in this country in many cases superior to similar machinery made abroad but developments made in the machinery line in this country have opened the eyes of a great many foreign mills who now and in the future will be looking to the United States for machinery and other equipment. I do not believe for instance that the German manufacturers who used to dominate the field will ever regain their strong foothold in overseas markets. They will be physically unable to do so in the first place and their prewar trade practices will backfire in the countries in question, if and when they can again produce machinery for export.

"People are already coming over to this country even from a country like Sweden in order to study our new processes in production of pulp and paper."

H. T. Newell, Jr., Back from Red Cross

JACKSON, Miss., November 12, 1945—H. T. Newell, president of the Jackson Paper Company, has welcomed back to the paper business his son, H. T. Newell, Jr., after a leave of absence of thirty-seven months in the Military Welfare Service of the Red Cross.

The Jackson Paper Company head also revealed additional plans for the operation of the company's new house in Meridian, with the announcement that H. T. Newell, Jr. had been named Manager of the Meridian house, which will be known as the Newell Paper Company. He has been active in the Jackson Paper Company for more than ten years, and recently was named vice-president. At the same time, W. K. Barnes was elected secretary-treasurer and Hugh O. Smith remains as vice-president and sales manager.

DeZurik Imports Its Regulators

A number of important improvements have recently been made by the DeZurik Shower Company, Sartell, Minn., in its consistency regulators. A new type of regulator box is designed to take pulp stock directly from high density washers and deckers. The regulator is installed under the decker spout or worm conveyor where the stock drops directly into the regulator. After regulation, the stock flows by gravity to a storage chest or other point desired. A new type of hydraulic predilution control valve connects to a shower mounted over the decker spout or conveyor. This predilution control valve is operated by a hydraulic cylinder which is controlled by a pilot valve connected to the primary valve on the regulator. As the stock leaves the decker or washer at any consistency, the shower reduces the consistency to within about 1 per cent of the final regulated consistency. The stock then flows into the regulator where the primary dilution valve adds the final dilution water.

This method of reducing the stock consistency in two stages coupled with automatic control of the shower water produces accurate regulation even where the stock is reduced from 15 per cent consistency as it comes off the cylinder to as low as 3 per cent when it leaves the regulator. The completely automatic control provided by the regulator elminates frequent attention to the washer or decker operation.

The regulators are offered with construction suitable for both acid and alkaline service with various sizes of primary and predilution valves to meet all tonnage and dilution requirements.

The standard regulators for installation ahead of jordans, paper machines, etc., now also include a number of improvements. The new type hydraulic predilution valve is available with these models. A new type of water spreader for the dilution water pipe increases mixing of the stock and water as it passes through the regulator.

Gerrard Offers New Box Strapping

A new, tough, pliable box strapping, bearing the name "Fiber-Steel," is offered by A. J. Gerrard & Co., Chicago. It consists of a highly flexible steel band core sheathed in a tough kraft paper which has been waterproofed. The smooth, wax-finished, water-repellent cover is scuff-resistant and provides proper tension without excessive biting into a corrugated box. Fiber-Steel strap can be applied directly to enameled or painted surfaces without danger of marrings, and can be handled by girl operators without danger of cut fingers. Because of its paper covering, trademarks and company names can be printed directly on it.

Metal Hose Booklet Full of Facts

The Chicago Metal Hose Corporation of Maywood, Illinois, has published a revised version of its 12-page booklet entitled, "Flexible Metal Hose for Every Industrial Use." This handy booklet contains a concise description of the company's complete line of flexible metal hose and fittings, together with technical specifications and pictures.

This pocket-sized booklet will be of interest to industrial men in virtually every field, for it contains many helpful tips on the use of flexible metal hose for a variety of applications, including the conveying of steam, gases, oils, and various types of searching fluids.

SLIME CAN'T BE BEAT BY COOKBOOK METHODS

The only certain thing about slime is that it plagues nearly every paper and board mill with increased costs, waste of labor and finished product rejections. There's no "sure-fire" recipe for slime elimination that can be applied with equal success in every mill.

Manufacturing processes are not identical in any two mills, and slime-control treatment consequently must be *individually* designed to meet the particular conditions at your mill. Methods used at another mill might be ineffectual or uneconomical at yours.

Slime-control deserves the same type of engineering skill employed in other operations which influence paper quality. That's why more than three hundred paper mills have made use of the wide experience of W&T engineers.

W&T ENGINEERED SLIME ELIMINATION is planned to destroy slime-forming organisms at the points where they can be attacked most effectively and economically — by Break-Point Chlorination in the fresh water supply and chloramine treatment at other selected points.

Why not have W&T engineers make a survey of your plant to find the points where slime-formers are most vulnerable and can be destroyed before they cause appreciable damage? Wallace & Tiernan Company, Inc., Newark 1, New Jersey. Represented in Principal Cities.

WALLACE & TIERNAN

Engineered SLIME ELIMINATION

F-48

Lobell Takes Over Stevenson Firm

Louis T. Stevenson, Inc., 60 East 42nd St., New York City, has changed its name to Stevenson Paper Co., Inc., effective October 22, 1945. The Corporation will continue to serve its established trade at its present location under the active management of Joseph B. Lobell.

Mrs. Louis T. Stevenson announces her resignation as secretary and treasurer and director of the corporation. Since her husband, who founded the business, left to join the War Production Board early in 1942, Mrs. Stevenson has been active in the management of the business. Mr. Lobell has been associated with her as vice-president for the last two years and now assumes the entire control and management of the business.

Two New Armstrong Humidifiers

Two new steam-type humidifiers, utilizing a venturi nozzle to discharge steam, are now in production at Armstrong Machine Works, Three Rivers, Michigan, manufacturers of steam traps, air traps, refrigeration purges, and steam-tvpe humidifiers. One of the models has a solenoid valve to automatically control the discharge of steam, while the other one has a hand-operated valve to meet the need for manually controlled humidification.

The venturi replaces an electric fan and motor used on the older Armstrong models. By virtue of fast steam discharge through the venturi thorough mixing with the air is assured.

One advantage of these new units is simplified maintenance, since there is no motor to oil. Elimination of the motor also reduces the electrical load on the humidistat, which controls relative humidity by making and breaking an electrical circuit.

New Hancock Plant Soon to Open

Manning, Maxwell & Moore, Inc., expect their new plant for the manufacture of Hancock Products, which is being built at the present time at Watertown, Mass., will be ready for occupancy shortly after the first of the new year. Greatly increased facilities with much more floor space and equipment will enable Hancock to build larger quantities of their well-known line of valves, inspirators, injectors and ejectors in shorter time, assuring quicker deliveries on all of these products.

Just as soon as the executive offices are completed at the new plant, the sales department for these products will be moved from the Bridgeport, Conn., plant to Watertown, with M. S. Palmer as department manager.

Dicalite Adds Eastern Staff

Los Angeles, Cal., November 12, 1945—Carrying out post war plans made many months ago, the sales and service engineering staff of the Dicalite Company is being enlarged rapidly. Four men have recently joined the company in the Eastern Division.

Gordon C. Garland, with extensive general sales engineering experience, will cover the New York metropolitan area.

Leo P. Newtown, whose previous connections have been mostly in the paper industry, is at present working in the New England states in connection with use of Dicalite materials in paper plants.

Marshall W. Ramsey, with both paper and textile industry experience, and lately with the Philadelphia Quartermaster Depot, is at present covering territory in the Philadelphia area.

Dwight S. Masters, just out of an Army captain's uniform, and with long previous technical experience in the paint and varnish industry, is now covering territory in Northern New Jersey.

Blomquist Joins Lawson

Herbert W. Blomquist, former Chief of Machinery Section, Printing and Publishing Branch of the War Production Board, joined the staff of E. P. Lawson Company on September 1st.

Mr. Blomquist has had wide experience in the industry, particularly in the printing machinery field and will serve in an executive capacity in the sale of the new Lawson Cutting Machine now in production that will be manufactured, sold, and serviced under the Lawson Trademark.

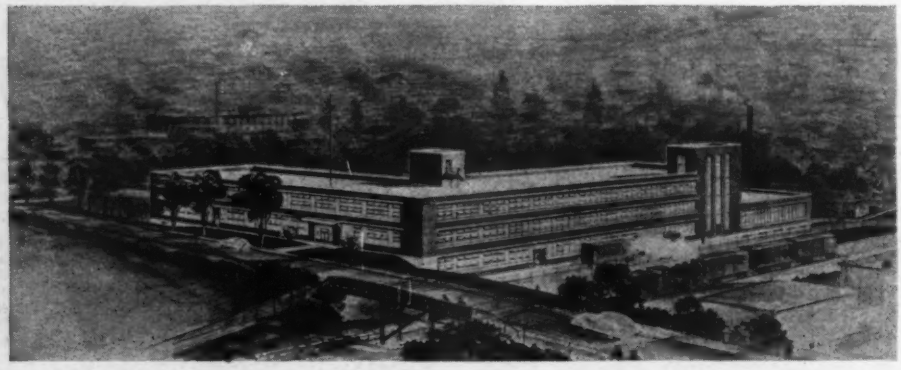
Mr. Blomquist is a native of Boston and attended Massachusetts Institute of Technology and Brown University. He will make his headquarters in the New York offices of the Lawson Company.

Becco Sales Offers Peroxide Bleach

The Buffalo Electro-Chemical Company, Inc., through its sales agent, the Becco Sales Corporation, Buffalo 7, New York, is introducing a new method of groundwood bleaching. The bleaching agent utilized is liquid hydrogen peroxide, long used by the textile industry in a similar manner.

All chemicals used are handled in tank cars. Since the chemicals can be pumped to the location needed, it is unnecessary to handle these materials in batches or individual containers. Preparation and mixing of the bleaching solutions is thereby eliminated.

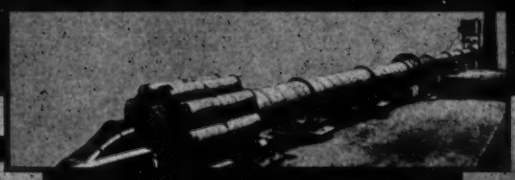
The bleaching takes place at pulp densities above 25 per cent consistency in from one to two hours. Very high brightness increments are obtained at very reasonable cost.



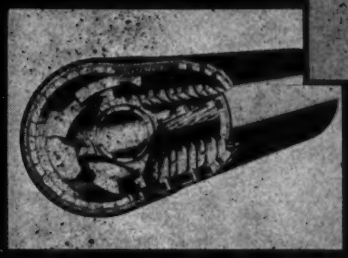
New Hancock Products plant now under construction at Watertown, Mass., for Manning, Maxwell & Moore.

UNAX ROTARY KILNS

HEAT EXCHANGERS



CHAIN SYSTEMS



SAVE FUEL

The UNAX KILN operates with low fuel consumption, producing a product of high quality and uniformity.

The UNAX COOLER is integral with the kiln, providing efficient cooling by means of the air for combustion, which in turn is preheated to a high degree thus saving fuel in the kiln.

The Chain System in the wet kiln and the heat exchangers in the dry kiln provide additional substantial fuel savings.

If you are burning lime or lime sludge, etc., write for information to determine the savings possible in your fuel consumption, thus reducing your manufacturing costs.

F. L. SMIDTH & CO.

11 WEST 42ND STREET — ENGINEERS AND MACHINERY MANUFACTURERS — NEW YORK, N. Y.

A-C Grinder Saves Wood Waste

Tons of bark and other waste wood now generally consigned to the fire as fuel will soon be efficiently processed for valuable uses in the manufacture of wood pressboard, predicts the Allis-Chalmers Mfg. Company, Milwaukee, Wis. Engineers of the company's basic industries section have revealed that waste products from lumber and box mills have

already been reduced to valuable fiber form in experimental operation of the recently redesigned Allis-Chalmers inter-plane grinder using newly developed grinding plates.

As a result of horizontal grinding, the fibrous product has desirable strength and adapts itself ideally to bonding under pressure in the manufacture of many combination wood plastic board products.

The application of inter-plane grinding using these special grinding plates can be expected to open up a whole new field for wood by-products and become an important step to the conservation of our fast disappearing forests, the company's announcement indicated.

Redwood Fills Variety of Needs

Redwood is an excellent material to use for the construction of the vertical tank or blow pit into which paper stock is blown from the digestor, including the false bottom construction used in this unit. Where blow pits are constructed of concrete, Redwood is an excellent material to use for the lining.

Redwood is also suitable for the construction of the chimney-like opening at the top of the blow pit and commonly known as the vomit stack, the California Redwood association points out.

In operations where the water which passes through, the perforated bottom of the blow pit is handled through a save-all, consideration should be given to the use of Redwood for the vat parts of the save-all.

Equipment of this character is subject to conditions that invite decay, and which is resisted by the use of all heart Redwood. The U. S. Forest Products Laboratory in their Wood Handbook, page 42, classify the heartwood of Redwood as "durable even when used under conditions that favor decay."

Redwood has been used for vomit stacks, blow pits and connecting units for over ten years and is giving satisfactory service.

Bureau Offers Reflectance Sets

WASHINGTON, D. C., October 31, 1945—The National Bureau of Standards is now prepared to issue sets of white, gray and black reflectance standards. Each set contains ten calibrated porcelain-enameled panels which diffusely reflect approximately 80, 70, 60, 40, 20, 15, 8, 4, 0.8, and 0.5 per cent, respectively, of the light that strikes them. They are 4 x 4 inches in size and have folded edges to minimize warpage resulting from enameling.

These standards are intended primarily for use with reflectometers used to measure paints, papers, textiles, ceramic products, and other opaque materials for reflectance and approximately color by the photoelectric tristimulus method. As was pointed out in NBS Circular C429 (July 1942) on photoelectric tristimulus colorimetry, accurate chromaticity measurements are possible only when samples and standard are spectrally similar. For this reason, accurate measurements of the colors of only near-white, near-gray and near-black materials are possible with the new standards. They are intended primarily for use with the multipurpose reflectometer developed at the National Bureau of Standards (J. Research NBS *25*, 581 (Nov. 1940(RP1345), and with other reflectometers used to measure 45°0° directional reflectance.

Each set is calibrated with the blue, amber and green filters described in NBS Circular C429, and is packed in a permanent, hinged-top, wooden box. The fee to non-government agencies is $50.00 a set.

Shaw-Box Builds New Gantry Frame

The Shaw-Box Crane & Hoist Divisions of Manning, Maxwell and Moore, Inc., Muskegon, Mich., have just placed on the market a new mobile load handling device of 2000 pounds capacity which provides a complete load handling unit that operates on the floor. It is being marketed under the trade name "Budgit Gantry 'A' Frame."

The unit is made available as a complete unit, or as an assembly which includes all parts to build the Gantry "A" Frame except the I-Beam which may be obtained locally.

When purchased as an assembly, the Gantry "A" Frame may be completed in one hour. The design is such that the I-Beam may be mounted on top of the Gantry legs or suspended from them.

The Gantry "A" Frame legs are former from steel pipe welded into rigid one-piece units, and mounted on heavy duty industrial casters equipped with anti-friction bearings and ball bearing thrusts to insure easy movement and free swiveling.

Hercules Advances Yates

WILMINGTON, Del., September 26, 1945—Appointment of Richard T. Yates, Jr., as assistant director of sales of Hercules Powder Company's Naval Stores Department, was announced today by G. F. Hogg, director of sales. Prior to his appointment, Mr. Yates was manager of domestic sales of the department. He became affiliated with Hercules in June, 1929, after graduating from Virginia Polytechnic Institute, with a bachelor of science degree in chemical engineering.

Mr. Yates was assigned to the company's Experiment Station, then at Kenvil, N. J., as a chemist, and in 1930, he was transferred to the sales division of Naval Stores.

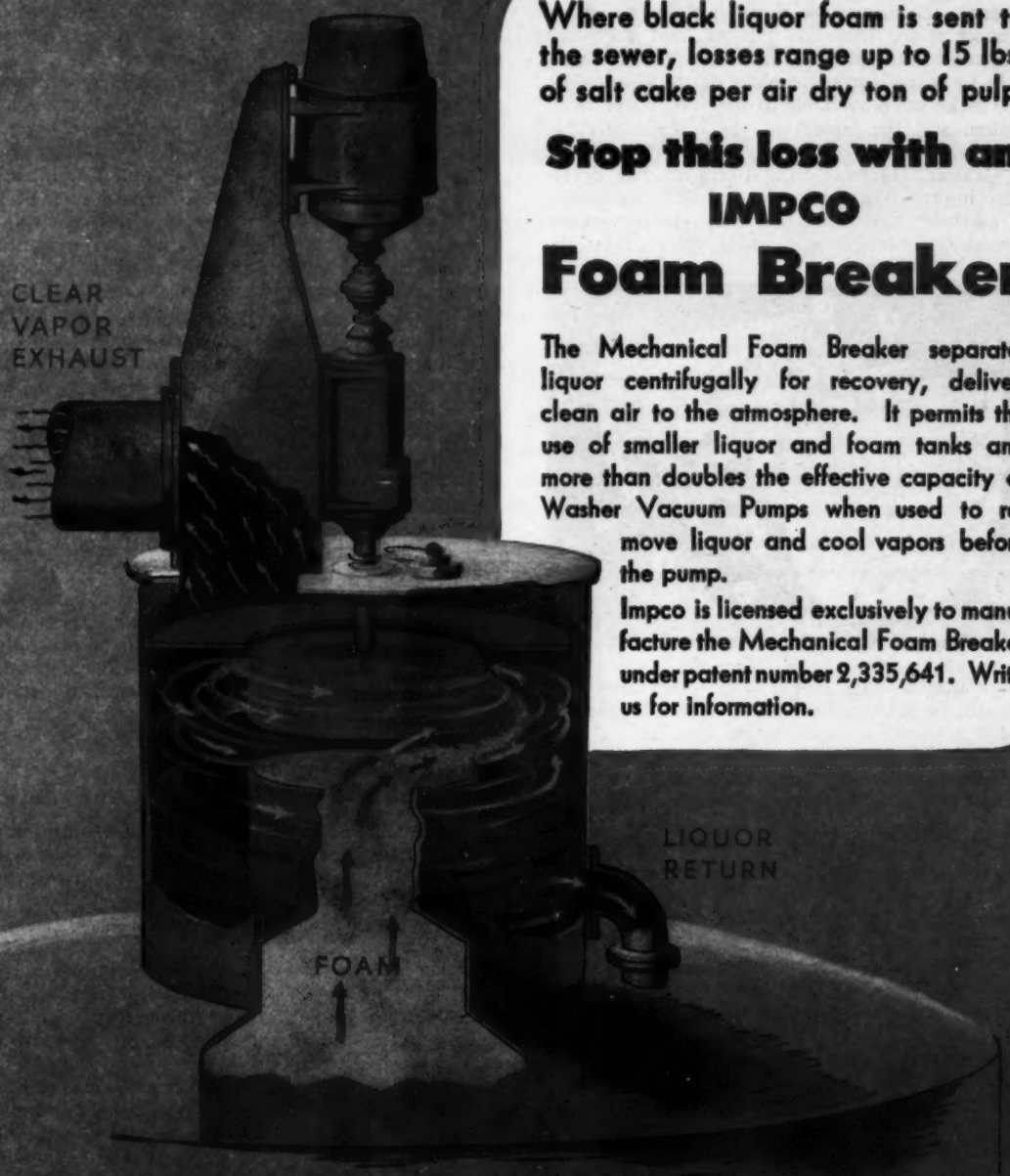
Are you losing Soda to the Sewer via Foam?

Where black liquor foam is sent to the sewer, losses range up to 15 lbs. of salt cake per air dry ton of pulp.

Stop this loss with an IMPCO Foam Breaker

The Mechanical Foam Breaker separates liquor centrifugally for recovery, delivers clean air to the atmosphere. It permits the use of smaller liquor and foam tanks and more than doubles the effective capacity of Washer Vacuum Pumps when used to remove liquor and cool vapors before the pump.

Impco is licensed exclusively to manufacture the Mechanical Foam Breaker under patent number 2,335,641. Write us for information.



IMPCO

Improved PAPER MACHINERY CORPORATION

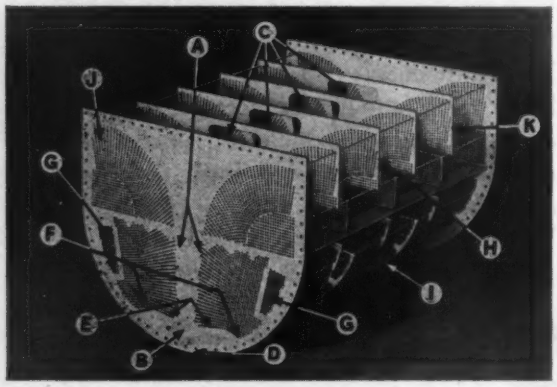
NASHUA, NEW HAMPSHIRE

Graham Offers Dual Condenser

One of the most important pieces of equipment in power plant operation is the surface condenser. Many economies can be effected in the operation of the surface condenser which will result in a very considerable saving, and for this reason the Graham Manufacturing Company has directed its attention towards improving surface condenser performance.

The function of a surface condenser is to maintain vacuum on the turbine through condensation of the exhaust steam from the turbine, and once that steam is condensed and the vacuum is produced it is desirable to do no further cooling of the condensate so as to make same available to the feed water heating system and the boilers at the highest possible temperature.

The Graham Manufacturing Company has developed an improved and simple type of condenser, known as their Dual Bank unit, wherein condensate is returned to the feed water heating system from the



condenser at an average temperature 6 deg. above the temperature of the incoming steam from the turbine exhaust.

A cut is shown directly above representing the internal arrangement of this design and it will be noted that there is a large venturi shaped passageway (A) that causes the steam to channel down to the base of the condenser at high velocity without any interruption and upon striking the water level in the hotwell the pressure at this point rises from two to four inches Hg above the absolute pressure at the turbine exhaust.

This repressured zone or repressured hotwell, as the manufacturer refers to it, is at a correspondingly high temperature and condensate showering off the lower bank of tubes (E) and (F) will be heated to a temperature somewhat below the temperature in this zone.

Actual data taken under operating conditions in almost 400 installations have shown this degree of positive reheat.

Another advantage that this high temperature condensate offers is improved deaeration. It will be realized the deaeration is dependent upon applying heat to the water that is to be deaerated when the maximum surface of the water is exposed to facilitate the liberation of the oxygen and inert gases.

It will also be noted that this design provides exceptionally fine longitudinal steam distribution (C), and the support plates that are of the segmental type (H), (K) and (I) therefore permit the steam to travel to all areas in the condenser.

All of the above advantages are accomplished with the minimum amount of baffling.

Ross Scrubber Heats White Water

From time to time in the past the problem of heating white water has been difficult to solve, because the conventional methods of either circulating fresh water through a pipe over which the vapors passed and spraying white water into the vapor air stream were impractical. The heat transfer for the pipe heating method was not sufficient to warrant the installation. Since the white water was generally delivered in the neighborhood of 60 degrees F., the apparatus and equipment required to do a satisfactory job was prohibitive.

The spray method ran into difficulties from nozzles clogging, and if the nozzles were large enough to eliminate clogging the drops of white water were so large there was very little heat gain.

These difficulties have been overcome by utilization of the J. O. Ross Engineering Corporation's Scrubber, which consists of a series of wheels rotating in a pan of white water and creating a spray into a chamber through which the vapors pass. A hopper catches the heated drops of white water, or eliminators stop the droplets which are collected in the hopper and piped to the users. A fine or coarse spray can be obtained very readily by this apparatus by merely changing the elevation of the white water in the pan.

The cost of operating such a system is low. There are no nozzles to clog since the wheels are designed for self cleaning action. The apparatus is low in first cost and gives a very satisfactory method of creating intimate contact between vapor and spray.

The white water heater can be used as an integral part of the briner air economizer system and the fresh water heating system.

It is possible to reclaim by a combination system of white water heating, air heating and fresh water heating, from 50 to 75 per cent of all the heat added to the air in passing through the mill. A combination system of vapor heat recovery is practical to install in Southern Mills even though they border on the Gulf of Mexico.

Marathon Tube Machine is Automatic

A new spiral tube winding machine manufactured by the Marathon Foundry & Machine Company, Wausau, Wis., will wind from three to twenty-one layers and automatically glue the paper; then automatically cut off the tube in lengths from 2 inches to 5 feet long.

The core paper, after being split to width in accordance with the inside diameter of the tube, is then placed on the reel and fed through the glue pot rollers, and excessive glue is wiped off automatically so that even distribution of glue is on paper. This then is fed through the cross belt on to the mandrel. After adjusting the number of stages to the number of layers of paper, the machine is placed in motion. Then, showing to the right of the winder is the automatic cut-off, which is sized for length in accordance with an electric eye.

Alloy

An alloy steel, heat treated but easily machinable, possessing high physical properties, extraordinary toughness, tremendous strength and fatigue resistance and is economical for parts subjected to sudden shocks by vibration, heavy loads and severe torsional strains, such as, Journal Pins, Shafts, Gears, Pinions, etc.

PUT *Beckman* pH CONTROL TO WORK IN *YOUR* PLANT

1. IMPROVING PRODUCTION QUALITY
2. REDUCING CORROSION
3. SAVING CHEMICALS
4. INCREASING PLANT EFFICIENCY

By Beckman-controlling the pH of your pulp processing operations you can make—not one—but FOUR vital savings in your production costs . . . important savings that mean a higher quality of paper at lower operating costs . . .

1. It is a well-known fact that the printing and aging properties of paper are largely dependent upon the pH of the finished paper. By Beckman-controlling your pulp processes to insure a neutral pH in the pulp, you can greatly improve the uniformity, the printing and aging qualities of your finished product.

2. By maintaining a controlled pH in the pulp, as it flows onto the wires, costly wire corrosion is reduced to a minimum, substantially cutting maintenance and upkeep costs.

3. Beckman-controlling the pulp processes eliminates "overdosing" and expensive waste of alum and other chemicals. This saving is particularly important with today's vital need for conserving chemicals for war industries.

4. Pulp having a controlled pH prevents "gumming" in the machine, stepping up plant efficiencies and production output with less down-time and maintenance.

LET US HELP YOU take full advantage of the multiple savings possible through Beckman pH Control. Our engineering staff will gladly make recommendations to fit your particular requirements.

NATIONAL TECHNICAL LABORATORIES
SOUTH PASADENA • CALIFORNIA

WORLD'S LARGEST MANUFACTURER OF GLASS ELECTRODE pH EQUIPMENT

The Beckman Automatic pH Indicator is the most advanced pH instrument available today. Incorporates many unique features found in no other make or type of equipment. Operates standard control and recording equipment. Ask for Bulletin 16!

The Beckman Industrial pH Meter is ideal for portable plant and field use. Simple, quick, accurate. May be used with Beckman Flow Type and Immersion Type Electrode Assemblies for maintaining pH check on solutions in process. Ask for Bulletin 21!

SEND FOR YOUR COPY OF THESE HELPFUL BECKMAN BOOKLETS!

"What Every Executive Should Know About pH"—a simple, non-technical discussion of what pH is, how it's used, and its importance to modern industrial operations.

Bulletin 86—The most complete catalog available on modern pH equipment. Lists and describes over 60 different electrodes together with accessory equipment for all types of applications.

Beckman THE LEADING NAME IN pH

. . NINE PROVED WAYS TO

When it comes to translating power plans into power plants, the Babcock & Wilcox Company can supply reliable and efficient boiler units complete with all essential components from fuel preparations and burning equipment to breechings and stacks. The company thus has control over both the designing and application of the equipment and coordinates the various elements to assure maximum dependability and economy of performance.

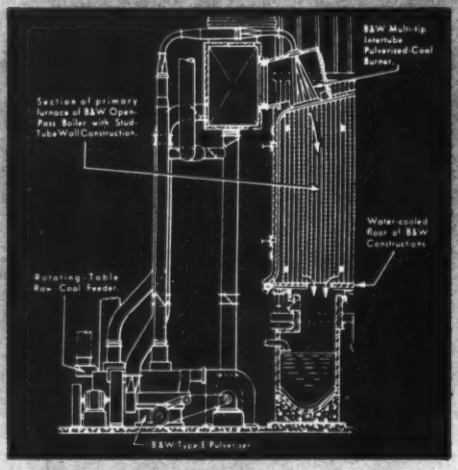
Much of the component equipment shown on these pages can be applied to modernizing, and thereby step up the efficiency of, existing power facilities.

When you select B&W steam-generating equipment for large or small plants, you get the benefit of over 60 years specialized experience in designing and fabricating boilers and related equipment with a long record of highly satisfactory service.

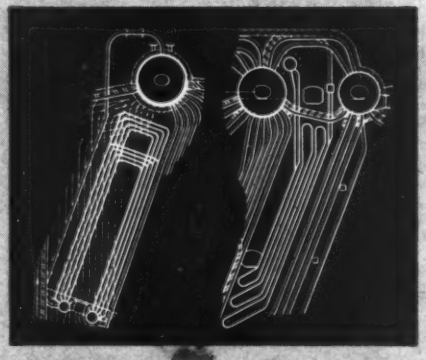
SEVEN STEPS TO A MODERN POWER PLANT

1. List minimum equipment and material essential to keep plant running for perhaps three years.
2. Meter, check, or estimate use of kwhr, steam, water, and air for each plant use, keeping postwar expansion possibilities in mind.
3. Make rough plan of the entirely new plant you would want to serve these needs. Secure costs of equipment and construction from consulting engineer or direct from manufacturers.
4. Compare new-plant plans with existing layout to find points of parallel arrangement, suitable locations for needed new items, building changes and the like.
5. Estimate fuel, labor and perhaps maintenance savings for each step of the modernization.
6. Calculate how long each individual improvement will take to pay for itself.
7. Prepare brief report suggesting that needed steps be approved first. Optional improvements can then be examined individually on the basis of the savings each will effect.

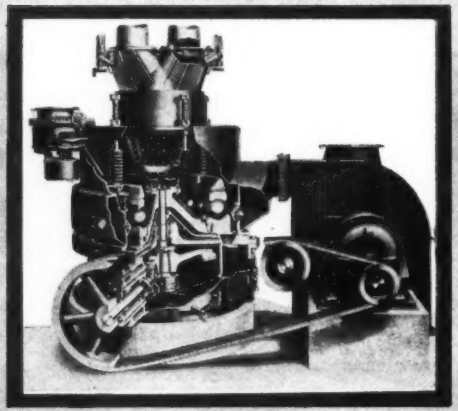
From POWER, December 1944.


B&W Multi-tip Interlube Pulverized Coal Burner.
Section of primary furnace of B&W Open-Pass Boiler with Stud-Tube Wall Construction.
Water-cooled Roof of B&W Construction.
Rotating-Table Raw Coal Feeder.
B&W Type E Pulverizer

B&W DIRECT-FIRING PULVERIZED-COAL SYSTEM. B&W direct-firing pulverized-coal system has advantages in ease of operation, reliability and upkeep that make it economical for small as well as large boilers. It is readily applied to oil-fired boilers for conversion to coal firing.

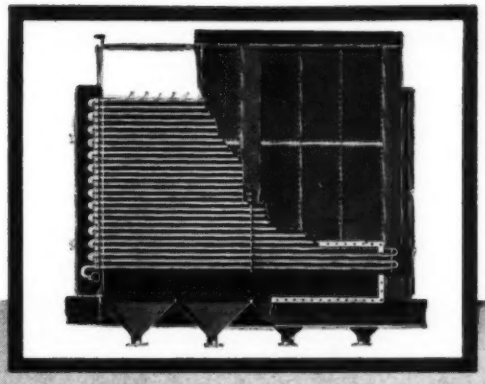


SUPERHEATERS. B&W Superheaters are properly designed and fabricated, with respect to steam and gas flow, to function efficiently with boilers designed and built by B&W. Available in both draining and non-draining types as shown.

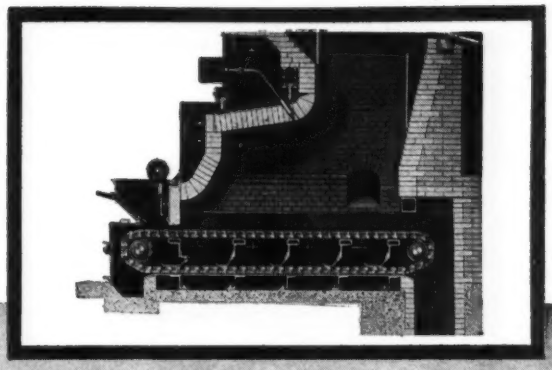


B&W PULVERIZERS. The simplicity and sturdiness of B&W ball-bearing type pulverizers assure high availability with low maintenance in direct-firing pulverized-coal systems. They provide consistently high fineness and respond quickly to changes in load with automatic control of raw-coal feed.

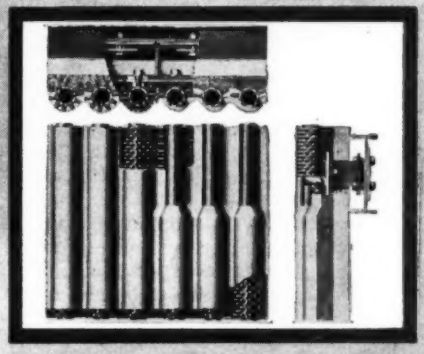
BOOST BOILER EFFICIENCY



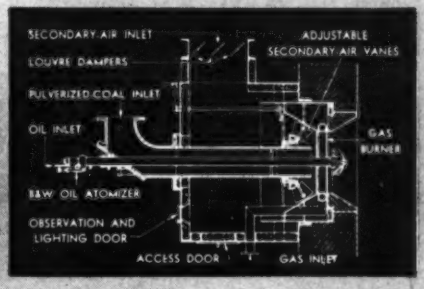
ECONOMIZERS. B&W Economizers effect appreciable savings in fuel and can be built to meet the size and pressure requirements of any installation. The Return-Bend Economizer shown can be easily cleaned, and pressure parts may be inspected externally while in service.



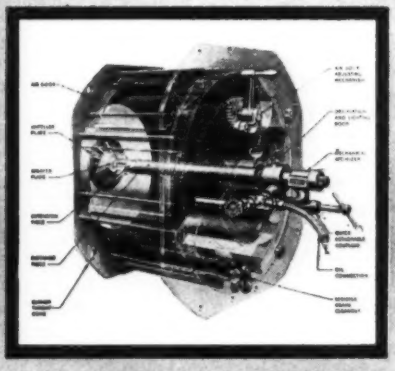
CHAIN-GRATE STOKERS. Babcock & Wilcox Chain-Grate Stokers are widely used with free-burning bituminous coal, anthracite, lignite, and coke breeze. They can be furnished for natural, induced, or forced draft, depending upon operating conditions.



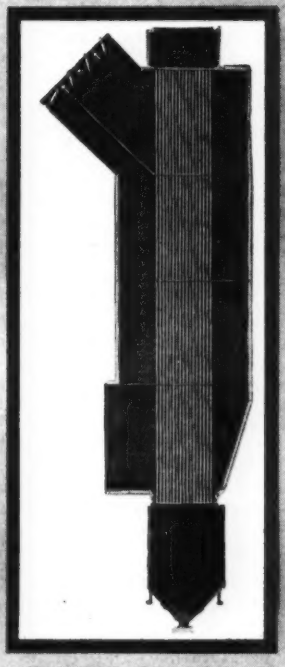
WATER-COOLED FURNACE CONSTRUCTIONS. B&W Water-Cooled Furnace Constructions are extensively applied for partial or complete water cooling of furnaces of all sizes, shapes, and forms, and with all fuels and combustion methods. Studded-tube type of construction is shown.



MULTIFUEL CIRCULAR BURNER. Pulverized solid fuels, oil, and gas are burned singly or in any combination with this burner. It provides a single means of efficiently burning a wide range of fuels, permitting advantage to be taken of variations in the availability and market prices of these fuels.



OIL BURNERS. B&W Oil Burners effect rapid and complete combustion at all rates of fuel feed, using mechanical, steam, or steam-mechanical atomizers, depending on the oil and operating conditions. Available in a range of heat liberating capacities that meet all requirements.



AIR HEATERS. B&W Tubular Air Heaters are inherently tight and efficient, and are easy to keep clean. Available in multi-pass gas flow type, as shown, or longitudinal gas-flow type, and in sizes to meet the requirements of any boiler installation.

THE BABCOCK & WILCOX CO. • 85 LIBERTY STREET, NEW YORK 6, N. Y.

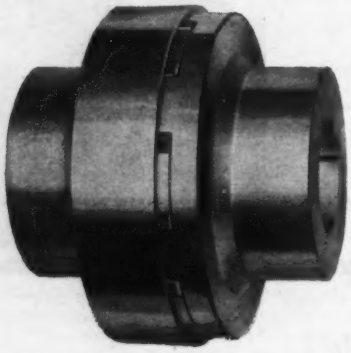
BABCOCK & WILCOX

G-294G

New Smoothness in Lovejoy Coupling

Overall smoothness that reduces resistance to minimum—even of airflow, and protection against contact with coupling bolt heads in operation, are embodied in the new L-R Type "C" flexible coupling announced by Lovejoy Flexible Coupling Company, 5009 West Lake St., Chicago 44, Illinois.

The essential feature of this new improvement is the outside steel collar which holds the load cushions in place. An extension of this collar which encircles the coupling, covers the heads of the bolts that secure



the load cushion retainer. The boltheads are concealed, yet readily and conveniently reached when necessity arises.

This improvement also effects more compact design. Ruggedly constructed, resistant to oil, fumes, moisture, and heat, it is especially efficient in pulp and paper mill transmission.

L-R Flexible Couplings of the Type "C" class are designed for heavy duty services from 2 to 2500 h.p. at 100 r.p.m. Individual free-floating load cushions between the jaws, are held in position between an inside steel sleeve, and the removable steel collar. Types are available for directly attaching to flywheel, also drum types and others for rapid disassembly without disturbing drive or driven equipment, etc. Cushions of various materials adapted to the particular service on which the coupling is used, are free to deform to every emergency—for correction of misalignment, protection from shock and vibration, and other transmission troubles which affect both drive and driven pulp and paper mill machinery. Smooth maximum power-flow is assured.

Cushions are always in sight. In operation half the cushions are idlers (except on reversing load). A new set of cushions is therefore always ready. No shutdowns for changing. No lubrication is required. The coupling is outstandingly quiet.

Literature and engineering information is now available on the new L-R Type "C" couplings on request to the manufacturer.

Sergt. Loud Returns to Trade

BOSTON, Mass., November 19, 1945—Staff Sergeant W. H. Loud, Jr., son of W. H. Loud, of Stimpson, Inc., has returned from a number of years in the service and has joined that company as a salesman. Sergeant Loud saw considerable action and was awarded the Bronze Star Medal for gallantry. He was in the 26th Division with General Patton's Third Army, going through France, Germany, Luxembourg, Austria and Czecho-Slovakia.

Electronic Equipment

The Chemical Publishing Company has just issued a book entitled "Electronic Equipment and Accessories" by R. C. Walker, (393 pp. 5½ x 8½, 343 pp. illustrated). The main object of this book is to present a simple introduction of the main features of the subject of electronics to practical engineers and others who are at least familiar with the elements of electricity and magnetism.

In the most usual case, the electron tube acts as a device in which a very small power serves to transfer some form of control to other apparatus which has an appreciable power consumption, so that it constitutes an essential link between the actuating impulses and the mechanism or recording equipment under control. Consequently, the use of an electronic device almost always involves some accessory equipment. Part of the book is therefore devoted to apparatus most frequently associated with electronic control of small mechanisms.

Among the subjects coxered are: thermionic valves, amplification of steady and low-voltage frequencies, gas-filled valves, light-sensitive devices, the cathode-ray tube, small switchgear, delayed action devices, impulse recording or counting, miscellaneous electronic devices and circuit accessories.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $6.00 per copy.

Henry J. Perry Opens Consulting Office

Henry J. Perry has announced the opening of an office as a consultant to the pulp and paper industry. He has been connected with the pulp and paper section of Arthur D. Little, Inc., Cambridge, Mass., and for the past fifteen years with the J. P. Lewis Company, Beaver Falls, N. Y., in operating and technical capacities.

Mr. Perry's experience covers a broad field in the manufacture, development, conversion and promotion of specialties, such as sanitary food packaging materials, automotive board, coated and embossed materials, show materials, electrical insulation, press boards, Latex and plastic treated materials as well as various printing specialties.

He has been a member of the Technical Association of the Pulp and Paper Industry, a vice-chairman of the Empire State Section of TAPPI and a past chairman of the Mechanical Pulping Committee. At present his office is located at 118 Main Street, Manchester, Conn.

Atlantic 33 Is a Special Steel

A special analysis alloy steel for chisels, punches, rock drills and shock tools which is easy to forge and harden—it requires no intricate equipment and saves time and labor in making and dressing tools—has been developed by the Atlantic Steel Company, New York City. The steel may be heated in a gas or electric furnace, open fire or even with an acetylene torch, which is sometimes best available when away from the regular machine shop, all with equally good results. To harden the steel it is only necessary to heat it and quench in water; no subsequent drawing or tempering required. The new "Flutagon" shaped bar adds greatly to safety and convenience. It affords a better grip, will not roll off sloping surfaces, and is easily identified for resharpening and redressing. Made in all sizes.

"THE BEST EQUIPPED MILL IN THE STATE!" he says

But is it?

Sure, it has fine, modern buildings with glass block windows. The production layout is the best that high-priced efficiency experts could devise. And the processing machinery is a marvel of mechanical perfection.

What's wrong with the picture? Just this. See the cluttered little room at the right? See the assortment of hand tools there, and the stack of knife blades? That's the knife grinding department!

One of the most important jobs in the mill is entrusted to makeshift tools and haphazard methods!

A modern, well-lighted knife grinding department is essential to sustained high production of quality paper. Dull or improperly sharpened knives can wreak havoc with your cost sheets. And with good blades hard to get, careful treatment becomes all the more important.

The Hanchett Company has been making knife maintenance equipment for over three generations. Its engineers and designers are constantly at work revising and testing new methods and new materials to help you keep knives in top cutting condition. Why not write them today, outlining your present and future requirements? They'll be glad to help you plan the layout and machines you need. You get the benefit of unbiased advice, too, since Hanchett manufactures a complete line of knife grinders and accessories. Write them today for Bulletin 114-PTJ!

The New GK Automatic Knife Grinder. Full cabinet base, built-in grinding head with ball-bearing spindle. Sizes from 32" to 120". Hydraulic or mechanical carriage travel.

★ ELECTRIC BRAZERS
★ ANVILS AND HAMMERS
★ BAND WHEEL GRINDERS
★ MISCELLANEOUS SAW & KNIFE FITTING EQUIPMENT

HANCHETT MANUFACTURING CO.
SAW AND KNIFE FITTING MACHINE DIVISION
BIG RAPIDS, MICHIGAN U.S.A.

★ SAW SHARPENERS
★ SAW STRETCHERS
★ KNIFE GRINDERS
★ SWAGES AND SHAPERS
★ WELDING CLAMPS

Hoosiers Halt for Inventory

INDIANAPOLIS, Ind., November 19, 1945—The paper trade in this section is getting ready for the annual inventory period, with a flood of orders for all grades and supplies low. Inventories this year will be as light as those which have featured the last few years. The trade just does not seem able to cut down the vast backlog of orders which has accumulated during the restrictions on paper. With this area gradually becoming "defensed" the demand from government sources is slightly below the average, but the decrease has not been nearly so drastic as was expected. Seven of the large defense plants here already have been declared unnecessary and the equipment will be sold by the government. However, many of the old time plants are converting to peace-time production as rapidly as possible and their demands for paper and paper products are expected to resume the ordinary level soon. Without priorities to which they have been accustomed, these plants will have to take their turn in securing supplies.

Demand during the last week for all sorts of containers was heavy. The Christmas demand is in full swing and it is possible that some users will be disappointed. Box makers say there has been some improvement in the labor situation, but there still is a shortage which likely will not be remedied until more men return from the various armed services.

Fine paper also was in demand last week with supplies strictly limited. Newsprint demand has increased and the only fly in the ointment is the limited supply.

The entire trade here is faced with the serious rise in production costs, due to higher wages and taxes. With ceiling prices being unaltered the trade wonders at times just what will happen.

All kinds of waste paper last week were in demand. Collections during the week were none too high and ceiling prices prevailed. Rag demand continued heavy.

Firemen and Oilers Negotiate Raise

HOLYOKE, Mass., November 17, 1945—A three-cent hourly raise, shift differentials and straight time pay for three holidays not worked are the chief new features of a contract just signed between the International Brotherhood of Firemen and Oilers, local 4, and six Holyoke paper manufacturers.

The union representatives who negotiated the contract, President Urban C. Fleming and William C. Murphy, plan to present a similar contract to various other paper mills in this vicinity in which the union's 100 members are employed.

Murphy announced that the contract covers American Writing Paper corporation and the Parsons, Valley, Franklin, Newton and Carew Paper mills. He added that an agreement to sign a similar contract has been reached with the Chemical Paper Manufacturing company.

The shift differential is four cents for the 3 to 11 shift and six cents for the 11 p.m. to 7 a.m. shift. This is the same rate embodied in the recent War Labor Board decision in the case of Eagle Lodge of Papermakers and Local 226, the finishers' union. It was the only matter in dispute between the firemen's union and the management and was the subject of a separate hearing and decision of the WLB.

The holidays agreed upon for workless pay are Fourth of July, Labor day and Christmas. If a man works any of these days he gets a day's pay on his next day off.

Union Ignores Conference

BOSTON, Mass., November 17, 1945—Officials of the Package Machinery company at Springfield responded the 15th to a request of state board of conciliation and arbitration to confer with its agents and officers of the CIO union at the Package plant, where a strike has been going on for two weeks.

But for the second time since this trouble arose union officials ignored the telegraphic requests of the state board.

"They will be summoned to appear," said State Labor Commissioner James T. Moriarity, when it was explained to him the board's telegram had been ignored.

Queried further as to what "summoned" means in this respect, the commissioner answered, "It means just the same as when applied to court procedure. The department has the power now to compel the union officials to appear.

Leo M. Messier, president of the Package Machinery UE-CIO union said he did not receive the telegram until two hours after the hearing was to have started. He said its contents were related to him from union headquarters where the telegram was received a few minutes earlier.

The company was represented at the hearing by its vice-president, George C. Ferver, by its general superintendent, C. Edward Hjelm and counsel, Louis W. Doherty. They indicated they are willing to do anything within reason to bring about a settlement, but also they felt the union officers were hardly showing cooperative spirit.

The board communicated with Western Union which conveyed the telegraphic request the day earlier and received reports that if the board had not been notified of the telegram's nondelivery it was to be assumed that it had been delivered.

The company officials apparently were aware the union officers would claim nonreceipt of the telegram as they were insistent on a check with the telegraph company on this point. Identical telegrams were sent to both sides it was stated at the board offices and copy of the telegram is part of the board's records in this matter.

Mosher Heads Marvellum Research

HOLYOKE, Mass., November 17, 1945—Robert H. Mosher has been named director of the new research and development laboratory being set up by the Marvellum company, Francis C. Haywood, president, announced today. This concern's technical department developed several products used by the armed service during the war and the management is opening a new research laboratory to enable the company to maintain a dominant position in the coated paper fields.

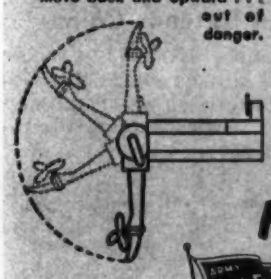
Mosher is a graduate of Massachusetts State College, 1940, and then took the course at the Institute of Paper Chemistry at Appleton, Wisc. For the past 3½ years he has been with the research department of the plastics division of the Monsanto Chemical company in Indian Orchard. While there he carried out studies on the development of the new synthetic resins and their application in conjunction with the products of the pulp and paper industry.

Mosher is a member of the Technical Association of the Pulp and Paper Industry and of the American Chemical society. He has published a number of technical papers in the field of paper and plastics. He begins his new work later this month.

UP your production schedule

WITH THE "HARBORMASTER"

The entire tail assembly may be elevated. Damage from submerged obstacles is prevented by a shear pin which shears off, automatically allowing the outboard drive to move back and upward . . . out of danger.



Doing your marine job better, *much better*, in *less* time is the goal of all operators. In the majority of cases the "Harbormaster" *does* it. Various models of these rugged heavy-duty Units, ranging from 45 H. P. to 330 H.P., are doing the job *better* all over the world with unparalleled *economy*, *efficiency* and *maneuverability*. Diesel or gasoline powered, the "Harbormaster" is easily applicable to many craft and vessels—from the illustrated dredging scow in daily operation at the Corner Brook plant of the Bowater's Newfoundland Pulp and Paper Mills to river towboats at work in South America.

Proved by constant action in all invasions these compact, dependable Units *do* the job much better—give operators the *tops* in all phases of operation. *Up your* production schedule,—write today for the new catalog and applications of the "Harbormaster", the Unit that gives more thrust per horsepower than any other conventional propelling and steering apparatus!

MURRAY & TREGURTHA, INC.

High Fidelity Marine Engines since 1885

60 HANCOCK STREET, QUINCY 71, MASS., U. S. A.

MATHEWSON MACHINE WORKS — Manufacturing Affiliate

SHERBROOKE MACHINERIES, LTD., SHERBROOKE, QUEBEC — Licensed Mfr. and Distributor for Canada

Worthy Will Sell or Close Plant

SPRINGFIELD, Mass., November 17, 1945—The Worthy Paper Company in North Agawam will be sold or, if no purchasers appear, will be liquidated, Gorham Bliss, president, said today. Bliss said the factor which forced the management to reach the decision was the recent action of plant employes in choosing the International Brotherhood of Papermakers, AFL, as sole bargaining agency for the company's 64 employes in a National Labor Relations Board election.

Emphatically denying that the company was anti-union, Bliss pointed out that from its inception the company has been unique in the paper industry by virtue of its production of unusual papers and that the relationship between management and its employes has also been on an unusual "family" basis.

To the accusation of a union organizer that the management was anti-union, Bliss replied that such is not the case. In 1935, when a question of organizing arose, Bliss informed his employes that he did not care what organization they belonged to but that membership in any organization would never be the price for a job at Worthy.

When the plant was in the process of being organized, the management, fearful that its actions might be misinterpreted as "intimidation," remained aloof and made no overtures, Bliss said. The union organizer, Fred Rochford, claiming a majority of the employes, demanded an NLRB election, which was conducted at the plant under the direction of William Schooer, NLRB field examiner, several weeks ago. The union won the election by one vote.

Bliss declared the union is not making any unusual demands, that the pay rate is the same or better than the other mills in the area.

Gair Declares Dividends

At a meeting of the Board of Directors of Robert Gair Company, Inc., held on November 20, 1945, a quarterly dividend of thirty cents (30c) per share in respect to the fourth quarter of the year 1945 was declared upon the Preferred Stock of the par value of $20 per share of the Company, payable December 21, 1945 to stockholders of record at the close of business on December 7, 1945, without the closing of the transfer books.

At the same meeting of the Board of Directors, a dividend of thirty cents (30c) a share was declared upon the Common Stock of the Company, payable December 21, 1945 to stockholders of record at the close of business December 7, 1945, without the closing of the transfer books.

National Fibre Makes Report

The National Vulcanized Fibre Company and its consolidated subsidiaries report sales of $8,699,681 for the nine months ended September 30. Net income before provision for taxes on income amounted to $1,579,109, while net after taxes totaled $478,887. These figures do not give effect to the recent recapitalization of the company. Comparable figures for the same period of 1944 are not available. For the calendar year 1944 net sales were $11,911,568 and net income $702,151 after income and excess profits taxes of $1,660,392. As of September 30, 1945, including cash of $1,644,540, current assets totaled $4,810,500, against current liabilities of $834,005.

Paper Mills Reject Wage Raise

HOLYOKE, Mass., November 17, 1945—Rumblings of a paper mill strike in Holyoke became audible when it became known among paper mill workers that the six local paper manfacturers had declined to grant the demands for a flat wage increase of 15 cents an hour. The refusal of the manufacturers will be transmitted formally to the members of Eagle Lodge of Papermakers at their next regular meeting.

What action will be taken by the Holyoke Paper Mill Workers, Local 226, associated with the Eagle Lodge in negotiating, is still undecided, but it is known that the members intend to take a determined attitude toward the manufacturers if the demand is not granted. Should there be a strike, there are 2000 members of both unions who will be involved and several hundred other workers may be thrown out of work.

The decision of the manufacturers was transmitted to the joint negotiating committee in the office of Harold T. Martin, labor adviser to the manufacturers. He offered no explanation beyond the flat statement of the refusal, according to the members of the negotiating committee.

The union members made further inquiry as to the reasons for the nonpayment of shift differentials, holiday pay for July 4 and Labor day and time and a half for the sixth day. These allowances which were granted recently by WLB directive are retroactive to June 1. Martin had no explanation to offer. Apart from the shift differentials, the union men claim the workers have two holiday pays coming and an additional three days for time and a half for the sixth day of the week.

A. W. P. Profits Off for Nine Months

HOLYOKE, Mass., November 17, 1945—Profits of the American Writing Paper corporation for the first nine months of 1945 after payment of all expenses, including provision for estimated federal income taxes, amounted to $108,017.39 as compared with $123,499.26 for the corresponding period of 1944, according to a statement received by stockholders today from Thomas Blodgett, chairman of the board and president.

For the third quarter of 1945, after all expenses and provisions for estimated federal income taxes, the net profit transferred to surplus was $28,581.85. The net amount transferred to surplus for the same quarter of 1944, was $39,300.78.

The report provides for estimated federal income and excess profit taxes at the composite rate of 65 per cent for 1945 and 60 per cent for 1944.

Crocker-McElwain Extends Colors

HOLYOKE, Mass., November 17, 1945—Crocker-McElwain company of this city announces that Certificate Bond is now manufactured in white and seven colors—blue, buff, canary, goldenrod, gray, green and pink.

Guardian Bond, 50 per cent rag content, is made in white only but Sales Promotion Manager Edson S. Dunbar, advises that the company is contemplating addition of three colors.

In both Certificate Index, 25 per cent rag, and Guardian Index, 50 per cent rag, the company has added ecru so that each line is now made in white and seven colors.

INCREASE AVERAGE PRODUCTIVE LIFE OF THIS EQUIPMENT 331%

- Calender rolls
- Press rolls
- Printing rolls
- Embossing rolls
- Tube rolls
- Wallpaper rolls
- Sizing rolls
- Pasting rolls
- Breaker rolls
- Sweat rolls
- Creping rolls
- Table rolls
- Carrying rolls
- Idler rolls
- Drying rolls
- Couch rolls
- Screen plates
- Slice lips
- Guide bars
- Suction box covers
- Evaporator tubes
- Pump parts
- Drying drums
- Fourdrinier wires
- Shake rails
- Tanks
- Mixing kettles
- Knives

WITH CRODON PLATING

Here's how CRODON (industrial chromium plating) prolongs the life of your paper mill equipment. Application of chromium plate produces an intensely hard, smooth, protective coat on practically all base metals. It resists wear and abrasion. It retards corrosion. It insures more efficient machine performance. Replacement costs are saved. Operating delays are prevented. Improved paper quality is assured.

CRODON plating of your paper mill equipment will be done in the quickest, most efficient, and economical manner possible. When you operate with CRODON-plated machinery, you produce better paper at less cost.

Detailed information will be sent on request, or we shall be glad to discuss CRODON plating with you personally. Call or write the nearest plant.

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The Chrome Plate

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1760 Lakeview Road
Cleveland 12, Ohio
Cedar 6660

4645 West Chicago Ave.
Chicago 51, Ill.
Austin 3716

K-C to Drop Specialty Lines

NEENAH, Wis., November 17, 1945—Change in policy, whereby Kimberly-Clark Corporation's Paper Division will increasingly concentrate on book paper, was announced this week by J. R. Kimberly, vice president in charge of sales, when he told that specialty papers were being dropped and announced simultaneously the establishment of a new district sales office in Atlanta, Georgia, as further indication of an accelerated book paper program.

In making the announcement, Mr. Kimberly commented that the fields of machine coated book papers and creped wadding products have always reflected the bulk of company effort and that demand for both has grown beyond essential manufacturing facilities; the company launched an accelerated production program last month with a $5,000,000 addition and modernization program at its Niagara, Wisconsin, book paper mill.

"The establishment of a new district sales office is one step in the direction of added service," Kimberly-Clark's vice president said, "and reflects—with the Niagara project and others under way—one main factor in our general program aimed at maximum support to our book paper distributors and customers in the expanding business days which they face." Preceding the Niagara development was the creation of a new technical laboratory at company headquarters in Neenah and, early this month, Kimberly-Clark arranged financing to the extent of $20,000,000, of which half was earmarked for further expansion.

George L. DuBois is the newly appointed District Manager of paper sales in District III, heretofore served jointly by sales offices in Districts I and II; District III covers southern states plus Oklahoma, Texas and New Mexico. Mr. DuBois is a veteran Kimberly-Clarker, starting with the company's manufacturing division in 1927 and moving from these into field sales and, more recently, acting as assistant to Lawrence Stedman, sales manager—Paper Division.

The new office is expected to open shortly after the first of the year.

Lieut. Walter Hicks Returns

Lieut. Walter R. Hicks, Jr., president of Daniel M. Hicks, Inc., New York, has been honorably discharged from the United States Navy after two and one-half years of active service, and has rejoined his concern, one of the oldest dealers in paper mill supplies in New York.

Lieut. Hicks while on the escort carrier Saginaw Bay, saw action in the many of the important battles in the Pacific, including Palau, Leyte, Luzon and Okinawa.

Incorporate Hoosier Mills

INDIANAPOLIS, Ind., November 12, 1945—Articles of incorporation have been filed with the Indiana secretary of state by the Hoosier State Paper Mills, Inc., 402 East Madison street, South Bend, Ind., formed to manufacture paper and paper products. The corporation has 1,000 shares of no par value capital stock and the incorporators are Daniel D. Lynch, Sam Shiner and Kay Lynch.

Simplicity Screens Salvage Fiber

The Simplicity Gyrating Screen using the same basic design that has always been used for this equipment, has had refinements added in construction details. The screen manufactured by the Simplicity Engineering Company, Durant, Mich., proved very successful in many paper mill installations. A number of screen installations for this purpose have been made, a considerable number of them in Canada.

In addition to the standard double deck chip screen, a number of paper mills are using small 2 x 3 foot single deck screens for the screening of good fiber from waste sawdust. At one mill a Model C single deck screen of this size equipped with 5/32" opening handled the sawdust from 18 cords of wood per hour. This little screen, which installed costs $400.00, reclaims one and one-half cords every day of good fiber from the waste sawdust line. The superintendent estimated a clear net profit of $3000. per year from this investment.

In another mill a similar operation screened $400.00 to $500.00 worth of good fiber from the waste sawdust during every month's operation. In this particular mill they chipped fifteen cords of wood per hour.

Faultless Casters Carry 9 Tons

Clarence B. Noelting, vice-president in charge of sales, Faultless Caster Corporation, Evansville, announces availability of their new No. "1300" Series super-dreadnaught caster for general industrial purposes.

The caster will roll and swivel easily under loads up to nine tons per caster. Probably this is a surprising performance to men who think of small casters under chairs or tea carts or even stockroom trucks, yet the war industries quickly proved the time and labor saving advantages of moving even the largest assemblies, like heavy bombers on mobile assembly lines bringing work to workers in an uninterrupted cycle.

Manufacturers and handlers of machinery or any cumbersome, awkward equipment will be interested in studying the possibilities of placing assembly lines on casters.

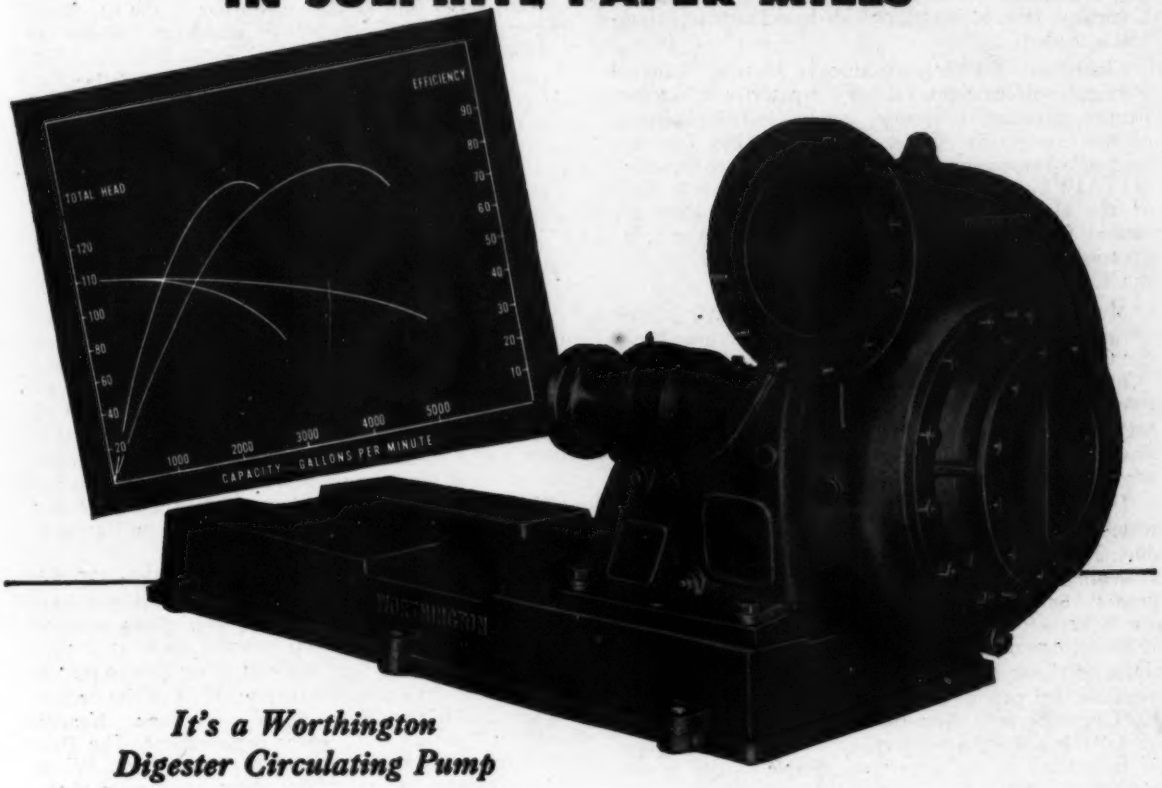
INDUSTRY PROTESTS OPA POLICIES

(Continued from page 74)

the general opinion of the industry representatives was to the effect that with sky-rocketing wages, many mills would be forced to curtail operations and return to a 40-hour work-week in order to survive at all. Even under the best of conditions, with the rapidly narrowing margin between costs and the existing price ceilings, marginal capacity in the industry will operate under great difficulties and there is little doubt, if conditions continue to follow the trends that now exist, much of this capacity will disappear from the picture. Unfortunately, this loss of production will occur chiefly in the field of low cost grades where the resulting injury to the consumer will be most serious.

"You are forcing customers of the industry to buy high priced products when normally lower priced products would be used. Customers are forced to this extreme by the fact that the paper mills of the country are forced out of the production of low end products in order to protect their economic position and survive."

HANDLING SULFUROUS ACID EFFICIENTLY IN SULPHITE PAPER MILLS



It's a Worthington Digester Circulating Pump

Corrosion-resistance is one yard stick for measuring the value of a pump for handling sulfurous acid. But *performance* is equally important.

You get *both* . . . maximum corrosion-resistance and peak performance . . . when you choose a Worthington Digester Circulating Pump. That's because Worthington engineers have the *unique* ability to design and manufacture stainless alloy pumps with the *hydraulic design* characteristic of pumps made of more easily-worked metals. The sample performance curve shown above tells its own story.

With more actual pumping experience . . . with the greatest research and manufacturing facilities in the field of hydraulics — it is natural that Worthington should lead in pump developments for paper manufacturing processes.

Whatever your process — Sulphite, Kraft or Soda — whatever your pumping problem, Worthington Pump Application Engineers have the knowledge and the line of pumps to put your process on a profitable basis.

For proof that *there's more worth in Worthington* . . . for a date with a Worthington P.A.E.* . . . write today. *Worthington Pump and Machinery Corporation, Harrison, New Jersey.* *Pump Application Engineer.

WORTHINGTON

24CS-1

THE WORLD'S LARGEST MANUFACTURER OF PUMPS

CENTRIFUGAL STOCK PUMPS Type FP. Handle all kinds of stock up to 6½% consistency. 4 sizes. Capacities up to 3200 GPM; heads up to 160 ft.; speeds up to 1750 RPM.

GENERAL PURPOSE PUMPS Type CP. Open impeller. Single stage. Sizes 1" to 4". Capacities up to 1000 GPM heads up to 130 ft.; speeds up to 2475 RPM.

BOILER FEED PUMPS Type UB 2. 7 sizes. Capacities up to 1500 GPM; heads up to 1000 ft.; speeds up to 3600 RPM.

New England TAPPI Discusses Cotton Linters

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Roger Smith Hotel, Holyoke, Mass., on Friday evening, November 16, 1945. L. B. Tucker of Crane & Company, Dalton, Mass., presided as chairman. About 150 attended.

Chairman Tucker introduced Messrs. Etienne Perrigot, director-general of Papeteries d'Arches, France, Howard Ferguson, newly elected chairman of the Connecticut Valley Division of the Superintendents Association and R. G. Macdonald, secretary of TAPPI. A rousing ovation was given to J. Burt of the Hurlbut Paper Company who has just returned from the Army and who received the Congressional Medal of Honor from the President of the United States.

Messrs. L. Kitchel and F. S. Van Wyck of the Virginia Cellulose Department of the Hercules Powder Company gave the presentation of the evening on "Cotton Linters in the Paper Industry." Mr. Kitchel traced the history of the use of linters in the industry, beginning in the twenties when a rather poor quality was used in the rag content mills. At present linters are prepared primarily as a chemical raw material.

The talk dealt primarily with second-cut linters which can now be obtained as a clean, uniform product. It is used in the paper industry for blotting and saturating papers and to some extent for higher grades. If used at 10% moisture many of the troubles due to knot formation will be minimized. About 10% of the cotton crop is linter stock. It runs about 98-99% alpha cellulose. From 12000-15000 tons of linters are available for paper. This year the smallest crop since 1929 is expected. First-cut linters are used largely in mattress filling, upholstery, etc., where the presence of field trash is not important. Staple cotton is too expensive for paper making and the price varies with the amount of the crop.

Those present included: J. J. Aid, F. R. Andrews, C. J. Barkus, R. Bagg, J. L. Barowsky, Seymour I. Barowsky, C. Benoit, G. L. Benson, J. Blanchard, M. Bleu, H. A. Boles, J. M. Booth, E. M. Brennan, J. H. Browne, Miss A. M. Brown, S. A. Brown, A. F. Brunell, J. Burt, F. Buss, J. Carey, G. Carroll, F. G. Casey, F. E. Caton, C. H. Child, J. Coburn, J. Constance, G. Cushine, C. Davidson, C. C. Decker, A. J. de Couagne, A. Dempsey, P. A. Donaghy, I. N. Esleeck, C. M. Fellows, H. Ferguson, T. J. Flaherty, W. L. Foote, G. B. Fowler, A. A. Frey, E. Gilmore, F. C. Glackner, V. Gooding, D. H. Gutermann, R. Heyden, C. I. Horton, D. Hansen, A. Jackson, F. A. Johnson, W. Kaufmann, R. E. Kilty, A. D. King, L. Kitchel, A. P. Knause, E. Krichels, W. S. Kumblad, P. J. Lavin, Miss D. M. Larose, B. Leavitt, M. J. Loveland, R. G. Macdonald, R. Mannheim, C. H. Manning, H. L. Mellen, H. R. Miller, R. H. Mosher, H. A. Norton, F. Nyboon, C. R. O'Neill, F. W. O'Rourke, T. F. Parkhill, G. F. Parks, R. W. Pattison, Etienne Perrigot, F. Perry, H. J. Perry, J. P. Phelps, T. R. Polson, C. L. Reece, A. E. Regnier, F. W. Schneider, G. Shattuck, L. W. Shattuck, A. A. Shaw, W. G. Sixt, C. H. Smith, L. E. Smith, L. N. Smith, Wm. Stillman, E. W. Strecker, J. J. Sullivan, Alver Sven, E. J. Sweeney, B. E. Teale, L. B. Tucker, D. D. Uong, F. S. Van Wyck, A. K. Warner, B. Welch, B. Wood, W. H. Wood, Wm. Woosnam, J. F. Wright, H. A. Wright, C. J. Yarber, J. T. Leecock, J. F. Fitzgerald, Wm. Whiting, A. F. Hobday, F. W. Gillespie.

Watertown TAPPI Hears Grondona

The Watertown Group of the TAPPI Empire State Section met at the Hotel Woodruff, Watertown, N. Y. on November 8th. D. Chace Mather of the St. Regis Paper Company presided as chairman. About 55 attended.

Charles A. Grondona of the Crown Zellerbach Corporation was the principal speaker and talked on his observation of the paper industry in Belgium. Mr. Grondona was one of a group sent to Belgium by the United States Army to help get the mills of the low countries into operation. The group had fifteen mills under their control for three and one-half months.

Mr. Grandona indicated that the Belgian mills were small. The machines run at about 350 ft. per min., but are quite adaptable to changes of grades and make a large range of grades. One mill hs a machine running at 1000 ft. per min. Great emphasis is put on paper quality and one mill has been operated by the same family for about six generations. Mill investments relative to production were found to be high but labor is generally plentiful and low paid. There is much more hand work than in the United States. Automatic machinery is rather scarce. There are apparently no cylinder machines used in Belgium for paperboard. This product is usually made on Fourdrinier-type machines.

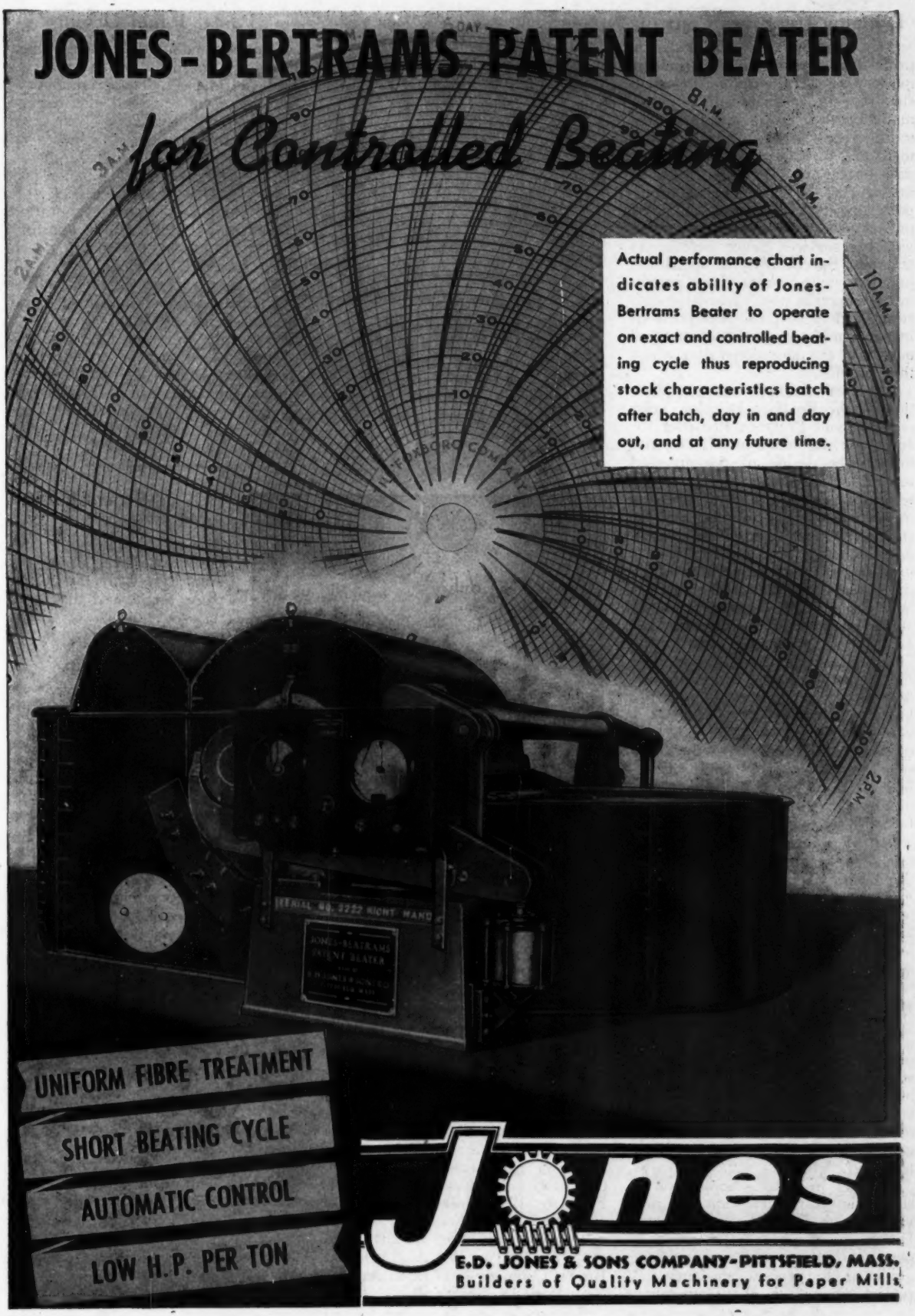
The annual capacity of the Belgian mills is 270,000 tons. There are relatively few technically trained men found in these mills. Craftsmanship plays an important part and mills keep samples back as far as seventy years. They take pride in being able to match color samples in a very short time. Most of the orders are small, being in the range of a few tons. Nearly every mill has its own power development. The Belgians regard German equipment as the best. When Mr. Grondona told operators about production capacity in the United States he was not believed. In Germany Mr. Grondona found that they were not equal to American mills although their buildings and installations were exceptionally good. Nearly nevery German sulphite mill had its alcohol plant which was financed by the Government.

There appeared to be but slight damage done to continental paper mills during the war. Of the 34 mills in France only one was destroyed and only two were partly down. In Holland four mills were partly down and one destroyed. Belgium had three mills partly down and none destroyed. In Norway one was destroyed and all but one capable of operation. Mills of Germany were considerably damaged. The mission established headquarters in Brussels and found that distances from there to the border were no greater than from New York to Albany.

Those present included: W. Arsenault, A. Alcombrack, E. P. Bernier, M. H. Bennett, G. W. Beal, J. W. Couture, John Francesconi, R. G. Goodwin, L. J. Gilligan, H. F. Greeney, F. C. Goodwill, C. A. Grondona, D. A. Hunter, W. Hebert, F. J. Hoar, M. Jaffe, J. T. Jenssen, A. B. Leachy, E. A. Loyst, H. J. Lynch, J. P. Lewis, A. McVicer, O .C. Munger, J. W. Morrow, Ed Moncleri, W. B. Mills, James Mills, D. C. Mather, M. D. Myers, L. P. Newton, M. M. Nolan, C. P. Nuspliger, T. Newcomb, J. P. Ormsby, C. O'Brien, H. W. Peck, H. Remington, H. Richard, H. M. Rice, K. W. Robertson, Fred Ramage, R. J. Schadt, C. J. Slack, H. A. Spencer, B. H. Treadwell, J. H. Treadwell.

JONES-BERTRAMS PATENT BEATER

for Controlled Beating



Actual performance chart indicates ability of Jones-Bertrams Beater to operate on exact and controlled beating cycle thus reproducing stock characteristics batch after batch, day in and day out, and at any future time.

UNIFORM FIBRE TREATMENT

SHORT BEATING CYCLE

AUTOMATIC CONTROL

LOW H.P. PER TON

Jones

E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.

Builders of Quality Machinery for Paper Mills

Dynalog Improves Control

The employment of electronic principles in industrial instruments marks one of the most important steps in the development of automatic control, and nowhere is this more evident than in the measurement and control of pulp and paper mill operations. Dynalog electronic instruments of The Foxboro Company already are in use in numerous mills, where they are performing valuable services never before obtainable. Specifically, the speed and precision with which these instruments function now furnish process records that surpass any previous instrument charts, in the amount and quality of the operational data which they provide.

A typical example is the application of the Foxboro Dynalog Temperature and Pressure Recorder for automatic digester control. Depending on the design of the digester, control of the steam supply is determined either by top pressure measurement or, preferably, by the cooking temperature. Three resistance bulbs are used for temperature measurement, located respectively in the top and bottom of the digester and, either in the circulation line or at middle-height of the digester. The recorder is a two-pen instrument. One pen records pressure; the other, the temperature pen, makes its record in a clear, sharp, step-shaped line, each three points of which represent the successive readings of the three resistance bulbs. The three distinct measurements, readily identified, are taken by the instrument continuously and automatically. Push buttons are provided, however, by which the operator can obtain an immediate reading of any of the three bulb temperatures, if desired.

When supplied as a part of Foxboro's "packaged" automatic digester control unit, this instrument is mounted in an attractive steel, cabinet-type panel, with a cam-set Digester Steaming Controller which, operating with the Temperature Recorder, controls the steam flow and maintains the digester on the desired, predetermined schedule. A third instrument mounted in the same panel, but operating independently, is an Indicating Temperature-Pressure Relation Controller, which automatically regulates the rate of top digester relief.

Another interesting application of electronic instrumentation is provided by the Dynalog Temperature Difference Recorder, wherever temperature change is an operating guide as to process efficiency. A typical example is the temperature rise of pulp passing through a jordan or a beater. The Dynalog Temperature Difference Recorder, having two thermal systems, measures the input and outlet temperatures and electronically subtracts one from the other, showing on its chart a one-pen record of the temperature difference. Such a chart record assures the operator as to the correct adjustment of his machine, or shows him what change in setting should be made in order to obtain maximum efficiency.

Clipper Saws Cut Bricks

Clipper masonry saws are used quite extensively through the pulp and paper industry for cutting special sized and shape fire brick and acid resisting brick with which to line acid chambers and tanks. The Clipper Manufacturing Company, 1515 Cherry St., Kansas City 8, Mo., has prepared a comprehensive

analysis of the problem, based on its experience with its equipment in many large paper mills, and is able to offer a machine fitted to the job for which it is bought. Its bulletin "An Index to Cutting Information" is available to those interested.

Maine Luncheon Planned

Owing to the extremely critical situation concerning hotel rooms in New York, it appears to the committee to be impracticable to make arrangmenets for a regular University of Maine Luncheon Meeting during the proposed paper convention in February, 1946. Maine men who have confirmed reservations and plan to attend the convention are invited to drop a card to W. A. Littlefield, Brown Company, 500 Fifth Avenue, New York 18, New York,

Faster Paper Drying

Impregnated paper is being dried at greater speed by means of Infra-Red gas burners. The original drying equipment consisted of a battery of steam cylinders.

Infra-Red burners 56 inches in length were installed in addition to the cylinders, no changes in the cylinder location being necessary. It was found that water evaporation was increased at the rate of approximately 115 pounds per hour for each 56-inch burner installed.

The use of Infra-Red or radiant gas burners has become very general in the textile industry where large amounts of water must be removed at high speed. In paper mills having a similar problem, comparable production increases can be obtained, it is declared by the Red-Ray Manufacturing Company, 455 W. 45th St., New York 19, N. Y.

Calco Starts Plant

S. C. Moody, General Manager of the Calco Chemical Division, of the American Cyanamid Company, announced this week that ground had been broken for the first units of the new research and technical sales service center, at Bound Brook, N. J. Present plans call for the immediate erection of the application and technical sales service laboratory units, according to J. H. McMurray, Calco Director of Engineering. The foundation will be laid at once and the unit completed by early Summer 1946.

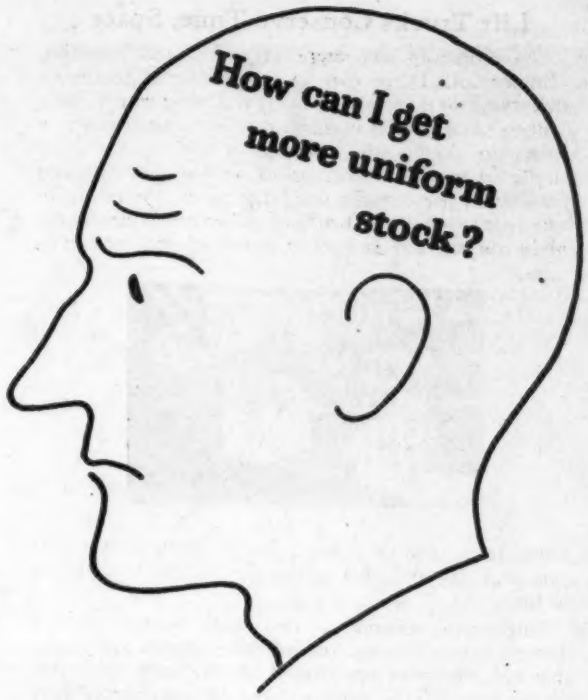
Paper Company Formed

Organization of the $1,000,000 Charlotte Paper Company with branches in Raleigh, Winston-Salem and Columbia, S. C., and the leasing of a building at 224 South Cedar street for home offices and warehouse here was announced November 18 by Clifford McGehee, president.

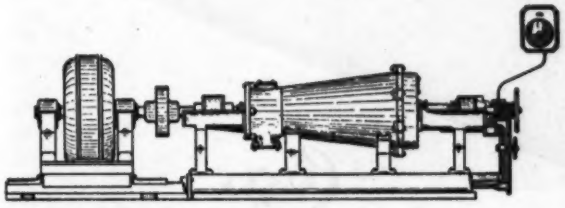
Mr. McGehee who is also president of the Jacksonville Paper Company of Jacksonville, Fla., and head of the Southern Industries Company, a paper converting manufacturer there, said plans call for the operations in this area in January.

The new industry for Charlotte is operated by three brothers: Clifford G. McGehee, president; Clyde C. McGehee, vice president, and M. R. McGehee, secretary-treasurer.

HEADACHE REMEDY for Jordan operators



You can get more uniform stock, in spite of normal variations in flow or consistency, with a **TAYLOR JORDAN PLUG PRESSURE RECORDER**



EVERY Jordan operator has three tough problems if he wants to deliver uniform stock to the machine. Stock Delivered, Consistency, and Plug Adjustment—each one can be a headache if it is not controlled.

Even slight variations in consistency or the amount delivered greatly affect the action of the Jordan on the stock and the uniformity as expressed in fibre length and degree of hydration. The Taylor Jordan Plug Pressure Recorder enables the operator to adjust the plug to a definite processing pressure regardless of normal variations.

The instrument is sensitive to the slightest variations. One superintendent states, "The thing that amazes all of us is its tremendous sensitivity. By careful setting of the handwheel, pressure adjustments as low as 100 psi. are obtained and these slight adjustments are sufficient to bring the stock to the quality desired."

It can be installed on practically every standard make of Jordan. It is available in ranges of 0 to 5,000 and 0 to 10,000 psi. It pays for itself over and over again in more uniform quality and power saved. Ask your Taylor Field Engineer! Or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.*

ARMY NAVY

Taylor Instruments

MEAN

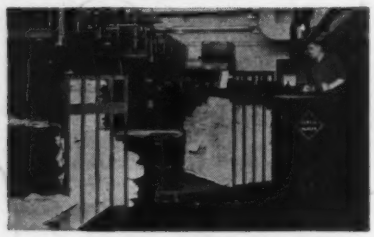
ACCURACY FIRST

IN HOME AND INDUSTRY

Buy Victory Bonds and Keep Them!

Lift Trucks Conserve Time, Space

The economic advantage of mechanical handling is important. There can be no standard measuring stick, because there are so many variables noted from plant to plant; but it is comparatively easy for power trucks to double the tonnage which a crew can handle in a given time, or to reduce the handling costs by 50 per cent. In one large plant, for example, four trucks handle 180 rolls of paper per hour, working in conjunction with other material handling equip-



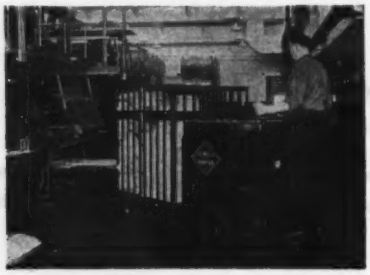
ment. In a smaller plant a single truck stores 110 tons in a day and also serves the presses with 10 to 30 tons.

Impressive economics too, have been made in storage space. Where roll handling trucks are available it is common practice to set the rolls vertically on the floor of the storage room or warehouse, then high-tier more rolls horizontally on top of the vertical rolls. Horizontal tiering of 2000-pound rolls is practicable up to 15 feet above floor level; consequently, floor space is utilized to the limit.

In one instance where manual handling was the practice for many years the storage space held 210 tons and required 8 or 10 men to do the stacking. The introduction of mechanical stacking, with a roll handling truck made it possible to store 620 tons in the same space, and one man does the whole job, with complete safety for himself and for the paper stock.

Racks made from light steel shapes welded into a strong, rigid structure and mounted on wheels have been devised for use by a large publishing house for handling heavy loads of printed paper stock as fast as it comes off the press with an Elwell-Parker low-lift power truck. The racks are about 2 feet wide, 4 feet long, and 4 feet high, and are open at top and bottom for easy loading and unloading. They have two sets of wheels, mounted at both ends on steel struts.

In use, the truck's platform is pushed under the side of the rack, between the two sets of wheels.

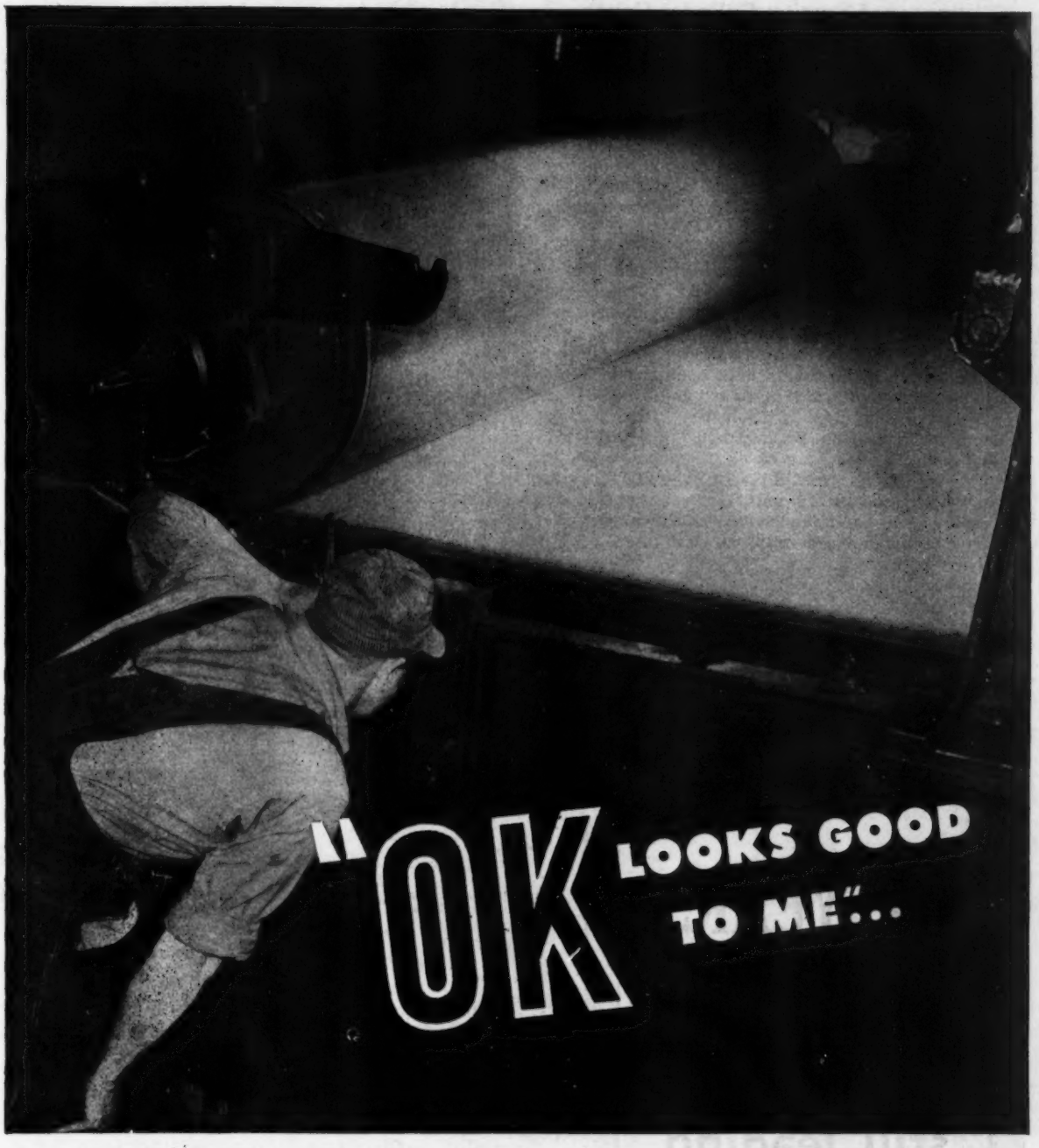


Either one or two loaded racks, weighing up to a total of 2 tons, may be picked up on the truck's platform and transportated quickly in printing plant or stock room. Wheels and light weight permit easy manual maneuvering of the empty racks. Similarly constructed racks may be used to transport a wide variety of materials with power trucks.

PULP

Perkins-Goodwin Co.
ESTABLISHED 1848
30 ROCKEFELLER PLAZA · NEW YORK
CHICAGO OFFICE: CHICAGO DAILY NEWS BLDG.

PAPER



THIS particular couch roll is attracting wide interest and attention. It is the first of many synthetic rubber rolls to be installed in one of the nation's largest board mills.

Recently the machine tender told us that the roll has just the right degree of resilience and is doing a fine job.

This mill is particularly proud of a record which has put it among the top producers of paper board this year.

We are no less proud of the contributions United States Rubber Company engineers have made in developing exactly the right compound for the specific job.

Serving Through Science

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE · ROCKEFELLER CENTER · NEW YORK 20, N. Y.

Improved Suction Cylinder Couch

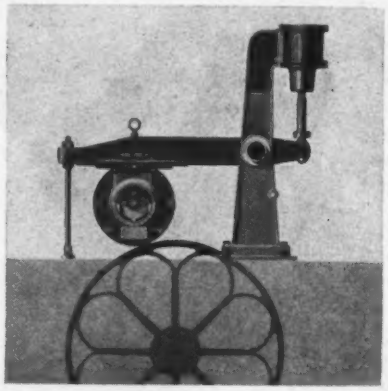
Shortly before the war, the Downingtown Mfg. Co., Downingtown, Pa., developed a Suction Cylinder Couch Roll and a few were built and installed, before restrictions were placed on new machinery orders. Post-war rolls of the same type have many design improvements, when compared with the pre-war installations, among which are suction connection through hollow couch arms and a penumatic lift to counterbalance the weight of the couch roll during operation.

The Downingtown suction cylinder couch removes more water by vacuum than a rubber couch does by pressure against the cylinder mould. There is little or no pressure between the suction cylinder couch and the cylinder mould. Obviously, this eliminates all tendency to crush and assures a sheet, tightly attached to the felt, with maximum bulk maintained. It also removes the air entrained in the felt and the wet sheet.

The couch is supplied 18 inches in diameter or about the same diameter as would be required in a plain couch. Like a plain couch, the suction cylinder couch requires no drive. Travel of the felt turns the roll, which is mounted in anti-friction bearings. However, the lack of weighting against the cylinder makes a drive on the mould desirable in most cases.

The Downingtown couch is drilled with countersunk holes, like a Fourdrinier suction couch, these holes being covered by a wire face with sewed or welded seam, like a suction extractor. This prevents any tendency to mark the sheet. The centrifugally cast bronze shell is spirally drilled. This patented drilling eliminates uneven wear on the suction box packing strips and subsequent scoring of the inside of the shell. The suction box opening is made in various widths, as required. The angular position of the suction box is adjustable from the front end, while running.

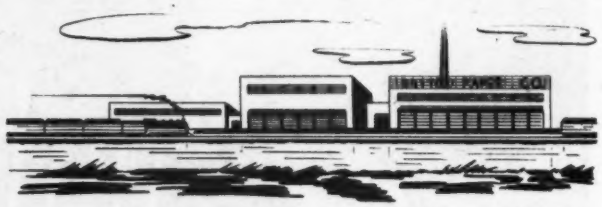
Suction is provided through hollow couch arms. When desired on long rolls, suction connection may be made at both ends. A pump is used with a separator tank or water leg, so installed that water does not pass through the pump. A pair of pneumatic cylinders is



provided to counterbalance the weight of the couch roll during operation. The stop is a safety device to prevent wire damage. The Suction cylinder couch is supported on anti-friction bearings which are mounted on the stationary journals of the suction box. The anti-friction bearings are enclosed in water-tight housings.

52 YEARS
A LEADER
and
still leading

Get a Good Start
And a Good Finish With
NORWOOD
WATER FILTERS AND
PAPER FINISHING MACHINERY



Since well back into the past century The Norwood Engineering Company has brought to the papermaking industry the engineering skill which branded Norwood a pioneer. Norwood Filters, Calenders and Paper Finishing Machines in streamlined new designs are today blazing new trails. Include them in your plans for new plants or modernization of older facilities.

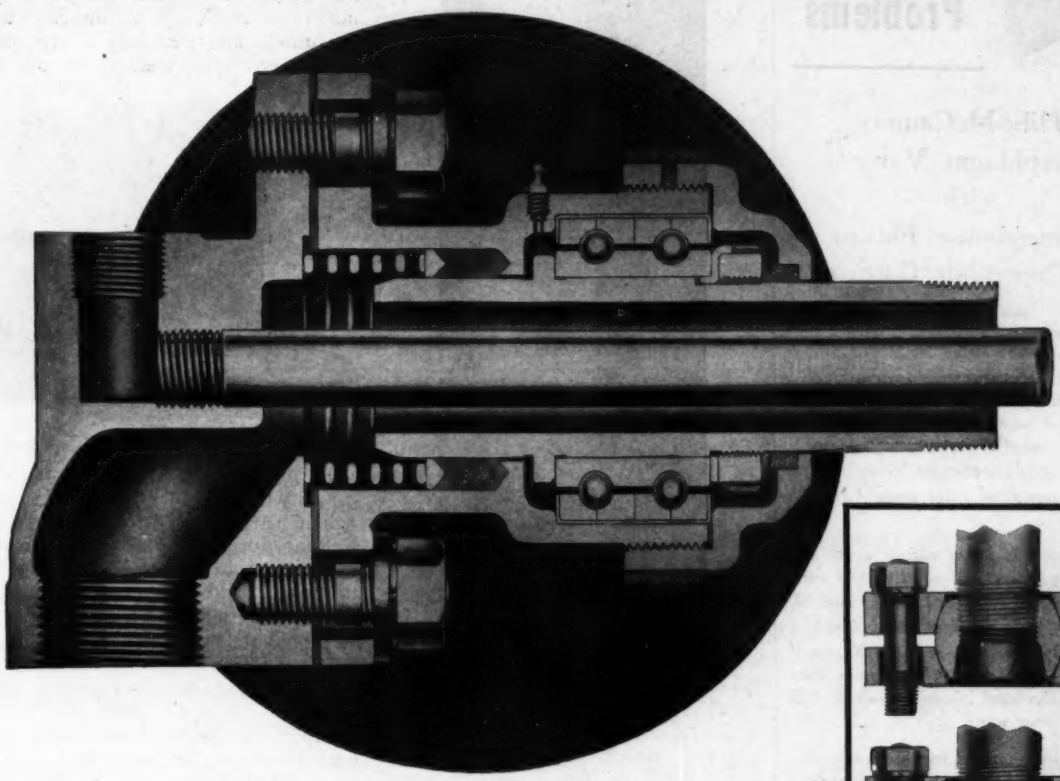
For valuable assistance and engineering service, write us fully about your expansion or modernization plans. Our Norwood engineers are fully versed in all papermaking and paper-converting problems and their solution. P-4

The NORWOOD
ENGINEERING COMPANY
17 N. MAPLE ST. FLORENCE, MASS.

BARCO'S

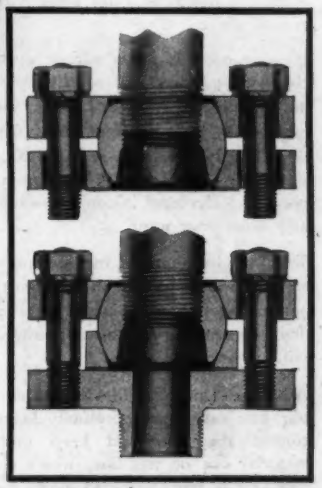
NEW REVOLVING JOINT

Designed Especially for the Paper Industry



BARCO FURTHER EXPANDS its line with a new joint intended for all types of rotating applications such as rolls, drums and dryers. An adjustable back syphon attachment removes water accumulated in the roll, due to condensation of steam. This permits the retention of greater heat in the roll.

For further particulars about this and other Barco Flexible Joints provided for the paper industry, write us concerning your needs and problems. The Barco Manufacturing Company, Not Inc., 1833 Winnemac Avenue, Chicago 40, Illinois.



BARCO BALL FLANGE

Cross-section view of Barco Ball Flange for use on threaded and flanged rolls and for correcting roll misalignment. The sleeve can rotate concentric even though threads on roll are tapped off center.

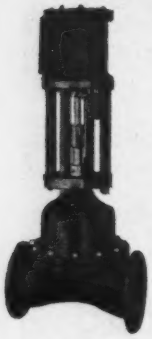
BARCO *FLEXIBLE JOINTS*

Free Enterprise—The Cornerstone of American Prosperity

In Canada: The Holden Co., Ltd., Montreal, Canada.

"MOVE IN EVERY DIRECTION"

The Answer



to Valve Remote Control Problems

. Hills-McCanna Diaphragm Valve with Westinghouse Flexair and Controlair Controls

Now you can have all the advantages of a Hills-McCanna valve . . . plus operation by air. It's the answer to many valve remote control problems. Westinghouse Flexair and/or Controlair Controls and an air actuated piston mounted on a Hills-McCanna Diaphragm Valve provide a reliable means of valve control from a central point.

If your need is for a simple open and close valve operation, a Hills-McCanna unit, equipped with a Flexair Control, may solve your problem. And where a throttling type valve is required, Controlair Controls and a Hills-McCanna Diaphragm Valve and Piston operation, will help meet your want.

Since all installations include an auxiliary air tank as part of the design, there's power to operate the valve even if the main air supply or all other power should fail.

And remember, Hills-McCanna Diaphragm Valves are absolutely leakproof, control the flow and keep unwanted material out of the line, won't clog or stick . . . have working parts isolated from the flow . . . and require no packing.

Write for the fact-packed blueprint. Available in sizes ranging from 4" to 12" inclusive.

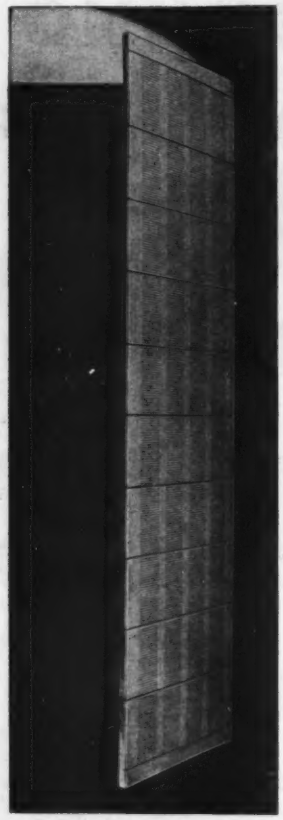
Hills-McCanna Company
2447 West Nelson St., Chicago 18, Ill.

HILLS-McCANNA
SAUNDERS PATENT
Diaphragm VALVES

Proportioning Pumps—Force-Feed Lubricators —Chemical Valves—Air & Water Valves Marine Valves — Magnesium Alloy Castings

Magnus Has Chrome Screen

Hardy Fabricated Chrome Nickel Steel Screen Plates, which are now rapidly replacing other types of plates on flat and rotary screens, represent a most economical method of manufacturing a screen plate



from a fairly expensive material which is quite difficult to machine. Made from channeled sections of material which is only 1/16 inch thick, they are sawed clear through without any relief milling. This develops very free and clean screening qualities which in addition to the long slot life has produced a plate which is the outstanding achievement in screen plate development in the 20th century.

General Box Makes Pallets

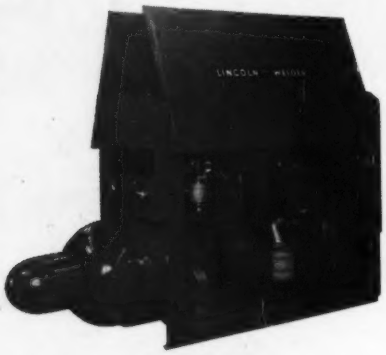
Important to users of containers is the recent announcement by the General Box Company of Chicago that they are now manufacturing shipping pallets and skids. The General Box pallet will be known to the trade as Generalift.

According to General Box officials, the design of the Generalift pallet will follow the part of the product policy already established by General Box Company. "Problems of handling and shipping, which the adoption of pallets may help to solve, will be studied by General Box engineers, and from their findings we will design Generalifts to meet individual needs," stated E. E. Ames, director of sales at General Box.

Lincoln Improves Its Line

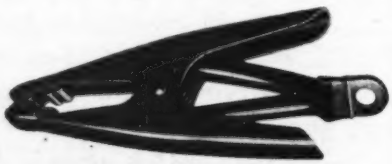
Additions and improvements to the line of arc welding machines and accessories of The Lincoln Electric Co., Cleveland, Ohio, of interest to the pulp and paper industries.

A new engine-driven model SA 200 Shield-Arc welder embodies innovations in design to increase the usefulness and efficiency of the engine-driven type welder. It differs

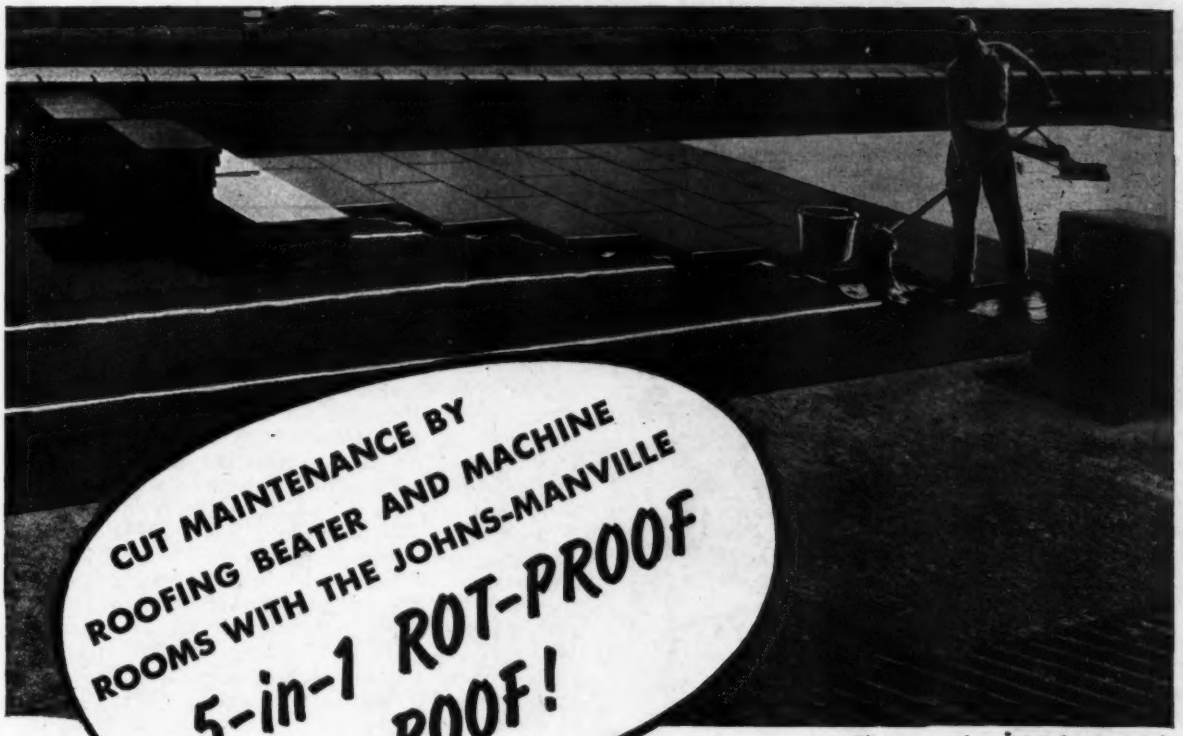


from previous models of 200 ampere capacity in: (1) "Job Selector" which varies speed of engine for welding duty giving accurate control of open circuit voltage resulting in improved welding control, minimum fuel consumption and engine wear; (2) powered by 4 cylinder, Continental engine of 29 horsepower, at 1400 revolutions per minute; (3) supplied complete with base and canopy; (4) rubber-cushioned engine mounting for smoother operation. This welder can be supplied with either rubber-tired or steel-tired trailer for high speed road trailing.

Also included among the new welding accessories developed by Lincoln is a low-priced ground clamp known as Type GC-3. The clamp is



designed so that each jaw connects independently to the ground cable. Thus, if one jaw fails to make contact due to heavy paint, scale, etc., the other jaw will carry the current. The unit has a heavy-duty steel frame with copper conductors and contacts, weighs 2½ pounds and has a jaw spread of 2½ inches.

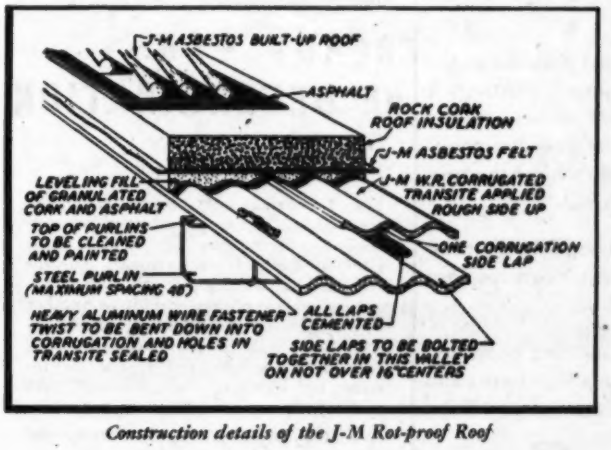


CUT MAINTENANCE BY ROOFING BEATER AND MACHINE ROOMS WITH THE JOHNS-MANVILLE

5-in-1 ROT-PROOF ROOF!

Five separate layers of roofing materials are applied for complete protection

HERE is an engineered roof for beater and machine rooms which solves many problems encountered in paper mills. Examine the construction details of this Johns-Manville Rot-proof Roof: *five separate layers* of roofing materials are used for protection against moisture (condensation and drip), heat and acid!


J-M ASBESTOS BUILT-UP ROOF
ASPHALT
ROCK CORK ROOF INSULATION
J-M ASBESTOS FELT
J-M W.R. CORRUGATED TRANSITE APPLIED ROUGH SIDE UP
LEVELING FILL OF GRANULATED CORK AND ASPHALT
TOP OF PURLINS TO BE CLEANED AND PAINTED
ONE CORRUGATION SIDE LAP
STEEL PURLIN (MAXIMUM SPACING 48")
HEAVY ALUMINUM WIRE FASTENER TWIST TO BE BENT DOWN INTO CORRUGATION AND HOLES IN TRANSITE SEALED
ALL LAPS CEMENTED
SIDE LAPS TO BE BOLTED TOGETHER IN THIS VALLEY ON NOT OVER 16" CENTERS

Construction details of the J-M Rot-proof Roof

This modern roof is waterproof on both sides, resists acid fumes. Heat transmission is ⅓ that of wood of equal thickness. Its high insulating qualities reduce possibility of condensation.

Every detail of construction is calculated for complete roofing security; rot-proof and fire-resistant; light weight and economical to maintain. The roof is fastened to the steel work in a way that permits both to move independently. Thickness of insulation is planned for your specific moisture conditions; remains effective during long service.

If you are planning a new roof or new building, call on the J-M Roofing Engineers to help you. Write: Johns-Manville, 22 East 40th Street, New York 16, N. Y.

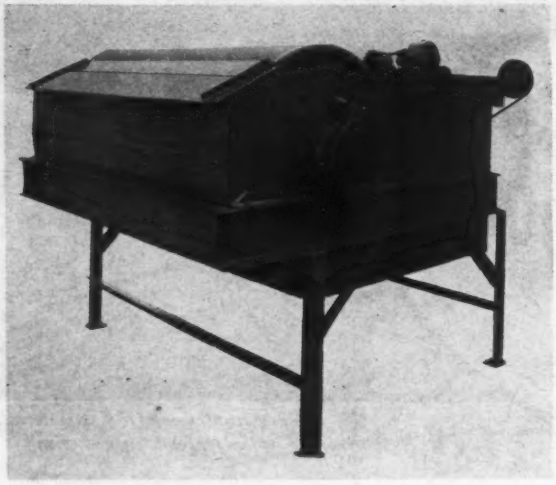
Johns-Manville *Rot-proof* INSULATED ROOFS

Smelser Improves Its Filters

The Smelser Rotary Filter offers an improved filter for the recovery of waste stock, or fibers, from the spent liquors in the pulp and paper industry.

In the future Smelser plans to use any material most applicable to individual requirements, using stainless steel, copper or brass. The Saveall cylinder vats to be constructed of wood, will be built in various sizes meeting specific capacity requirements.

Expansion plans now are under way, and at present several large filters are under construction for delivery this year. In 1946 the company plans to build larger and still better filtering equipment than ever before, incorporating several new and improved features in addition to the exclusive patented features which present many operating advantages. Improvements will include additional anti-friction bearings, efficient internal sprays which will keep the face wire clean and free from clopping, and other improvements on which patents are pending.



Hex-Bar Grating Comes to the Front

Increasing in popularity as flooring structure is a type of open steel flooring with an exclusive hexagonal cross bar design, fillet welded into the main bars. Fillet welding means the cross bars are pressure-set into the main bars, with the displaced metal forming the weld. This fillet weld design produces grating which exceeds all former strength standards for open steel flooring and stair treads. The combination of the fillet weld and the hex cross bar also makes for greater safety and ease of maintenance, since grease, water and dirt will not stick to the 6-sided bars. Slipping and skidding is reduced, and in addition, the grating is easily kept clean.

Another advantage of this hex bar grating is that it allows maximum ventilation and transition of maximum light. The self-cleaning surfaces are partly responsible for this, because the grating doesn't become clogged. Also, the 90-degree corners of the cross bars make room for more light and air to pass through, besides actually acting as reflectors for light.

Fillet weld, hexagonal open steel flooring and stair treads are manufactured by the Walter Bates Company of Joliet, Illinois.

PUT THE ARCH ENEMY OF CLEAN PULP AND PAPER BEHIND BARS

Now is the time to prepare for stiffer competition. Only the cleanest papers will have a place in the future for people appreciate clean paper.

Over 300 pulp and paper mills throughout the world have found Vortraps a simple, economical and efficient means of overcoming troublesome dirt problems. They substantially add to the useful life of wires and felts.

Floor space occupied is small and piping changes necessary to fit Vortraps into existing systems are few.

Vortraps contain no moving parts, use little power, are on the job 24 hours and require practically no labor to operate.

NICHOLS

ENGINEERING & NERCO RESEARCH CORP.

60 WALL TOWER
NEW YORK 5, N. Y.

UNIVERSITY TOWER BLDG.
MONTREAL, P. Q.

READY FOR ph DETERMINATION

PLUG INTO ANY 110 VOLT A.C. OUTLET

The Cambridge pH meter is always "ready-to-go". It may be turned on continuously during the day so that it is available for pH measurements immediately without waiting through a warming-up period to obtain stability. Another feature of the *Cambridge* is the Electron-Ray Null Indicator. It permits quick, hairline adjustment and cannot be injured by hasty or inexperienced mismanipulation.

Available in Laboratory and Industrial Models.

Send for Bulletin 901 E

CAMBRIDGE INSTRUMENT CO., INC.

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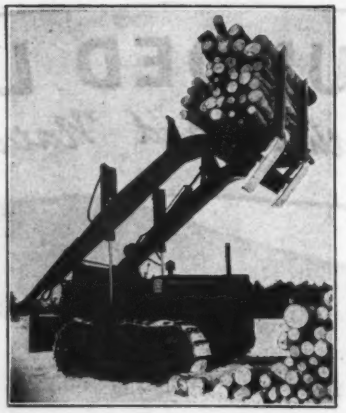
COMPOUNDED LATICES
Synthetic and Natural
GR-S, HYCAR and NEOPRENE COMPOUNDS
SURFACE ACTIVE AGENTS
Agawam Chemicals Inc.
TRADE
AGCHEM
MARK
LABORATORY AND OFFICES AT WEST SPRINGFIELD, MASS.
A complete service for Paper Coating, Sizing and
Impregnating in Latex and Synthetic Resin Emulsions

Drott Loads Pulp Wood

The Drott Skid-Loader, made by the Hi-Way Service Corporation, Milwaukee, Wis., is a hydraulically operated machine mounted on crawler type tractors, preferably long track, wide gauge models. In all cases the pump is mounted at the front end of the tractor and securely attached under the radiator completely guarded so that no damage can be done to the pump or the power-take-off while operating in the woods or rough country. The controls are within easy reach of the operator and are of center locking



nature which allows the levers to return to a neutral position when released by the operator. The specifications show the amount of loads which can be lifted by either of the models of Skid-Loader, also the heights, width, lengths and other desired information. The capacities of loads as we show on our specifications are conservative. On one operation in Northern Wisconsin last winter the Model 60 Drott Skid-Loader loaded 18½ cords of 8-foot pulpwood in 18 minutes with one man as top loader. This man was a truck driver and of course one man for operating the Drott Skid-Loader. This figure went against seven men with a jammer which loaded the same amount of pulpwood, same length of stocks, in 55 minutes. The men consisted of two snow shovelers for shoveling snow off from top and around the pulpwood pile, two men for loading slings, two men top loading and the jammer operator.

1855

BACKGROUND

We're proud of the background of the W. G. P. organization which started over 85 years ago. None of the founders are among us today, but all of us here at W. G. P. have been in the paper business for many years. For example: The three principals have collectively been connected with this firm for over a century. This long experience and service is undoubtedly responsible for the confidence and the continued good will that W. G. P. enjoys today. W. G. P. is vitally interested in making additional mill connections—both for the present and the future. If any part of your output is available for the domestic or export field, write us at once.

PAPERS
Printing, Converting, Industrial
TISSUE AND BOARD — SPIRAL MILL CORES — MILL SUPPLIES
LAMP SHADE SPECIALISTS
Saturating Papers for Plastics and Natural or Synthetic Rubber
Eastern Representatives for E. J. Cady Paper Scales and Micrometers
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When More Paper and Board Is Available Depend Upon Us to Supply Our Share

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EXPORTS TO ALL PARTS OF THE WORLD
PAPER AND BOARD

Stonhard Floors Stand Up

The Stonhard Company of Philadelphia has perfected a Semi-Plastic Non-Skid Coating for wood, cement or metal floors that are subjected to heavy abuse. Maintenance superintendents will appreciate its semi-plastic trowel consistency holding the abrasive fixed and in place. It may be applied with brush or

trowel making it possible to place where clearance may be as little as 4 inches, just high enough to handle the trowel.

It is practical as it will withstand light trucking. Its finish is fine enough so as not to accumulate dirt and dust making it sanitary and easy to clean. Attractive color schemes can be followed or worked out with its range of five colors. Its non-skid qualities will fit in with safety campaign.

New Log Chain Link

Chain Belt Company of Milwaukee is now manufacturing a new type log chain known as the "8,000" series. It is intended to be used as a log haul or refuse conveyor, replacing the old style long link coil chain.

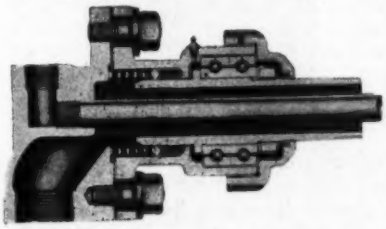
The new series is made of cast block links alternated with steel side bar links. The cast links are reinforced with two struts which also serve as anchors for the various attachments. They are built wide to provide a large sliding surface. Connecting side bars are made of rolled

steel, assembled with heat treated rivets. Where greater strength is desired, or where resistance to corrosion is paramount, the center links can be cast of Rex Z-Metal which is 25% stronger than the best quality malleable iron.

The conveyor will operate on existing conveyor runways and over the same drums as that of the coil type, although they require a new driving sprocket. They will flex smoothly around as small as 24 inch diameter head and tail sprockets.

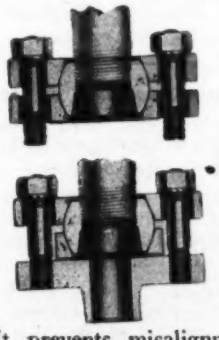
Barco Adds Two Joints

A new type revolving joint, designed by Barco Manufacturing Co., Chicago, is adaptable to all types of



rotating applications, such as rolls, drums and dryers in paper mills. An adjustable syphon attachment automatically removes water caused by condensation of steam in paper rolls.

A new Barco Ball Flange also has been added recently to the Barco



line. It prevents misalignment of threaded and flanged paper mill rolls. The design permits concentric rotation of the sleeve, even though the threads in the roll are tapped off center.

HISTORICAL HIGHLIGHTS OF PAPERMAKING NO. 20

Fighting Sermon

That's a printed sermon winning the battle raging about the old Tenant Church in Philadelphia during the Revolutionary War.

Just before the battle, it was found that the paper supply was running dangerously low. Vital, it had to be procured. Muskets required it for "wadding."

Files of soldiers were sent throughout the city to gather whatever they could find. At last, in a garret of a house formerly occupied by Benjamin Franklin, they discovered 2,500 copies of a sermon by Rev. Gilbert Tenant on "Defensive War."

With their paper loot, the fighting colonials won the day. Certainly, this was one of the most forceful sermons ever "delivered."

☆ ☆ ☆ ☆

At Cheney Bigelow we, too, use effective methods. Ours are directed toward supplying the paper industry with Fourdrinier wires, dandy rolls, cylinders and paper mill wire cloth.

CHENEY BIGELOW

Fourdrinier Wires • • Dandys • • Cylinders • • Wire Cloth

CHENEY BIGELOW WIRE WORKS · 417 LIBERTY STREET · SPRINGFIELD, MASS.

New Chlorine Comparators

A complete new line of LaMotte Chlorine Control Units has been made available, paralleling the recent advances in the more effective chlorination procedures, involving free chlorine, hypochlorites and chloramines. The latest recommendations of the Committee on Control of Chlorination of the American Water Works Association have been followed and a new series of standards have been prepared of a size interchangeable with the regular LaMotte pH Color Standards.

This new and revised equipment

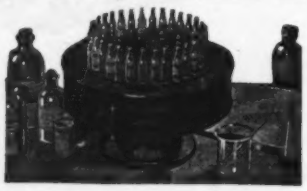
includes:

The Chlorine Block Comparator (standard model) for Medium Chlorine Concentration 0.1 to 1.0 p.p.m. in 0.1 intervals.

The H-C Chlorine Block Comparator for high chlorine concentration, range 1.0 to 10.0 p.p.m. in 1.0 intervals, and by dilution to 200 p.p.m. and above. Either of these models can be supplied with any selected part of the full chlorine range 0.1 to 10.0 p.p.m.

The Wide Range Chlorine Comparator, range 0.1 to 10.0 p.p.m. and by dilution to 200 p.p.m. and above.

The Chlorine Roulette Comparator, range 0.1 to 10.0 p.p.m. and by dilution to 200 p.p.m. and above. This instrument provides a permanent laboratory installation having



an illuminated dalite field by which chlorine determinations may be made under any light condition, day or night.

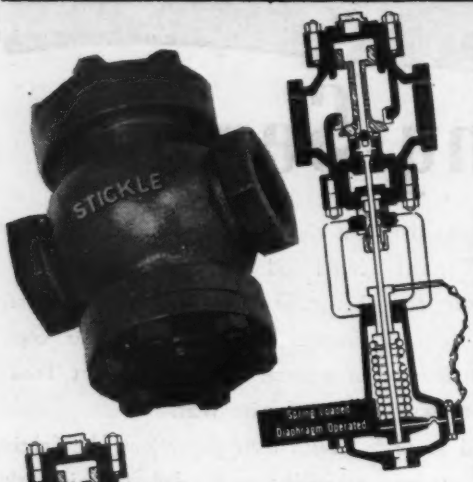
The LaMotte Sterilization Outfit for the control of chlorine under certain special conditions where the concentrations to be controlled lie within fixed limits. In this outfit the

values are 15, 30, 50 and 100 p.p.m. of chlorine, and by dilution higher concentrations may be measured.

In addition, any of the above may be supplied with the Ortho-tolidine-Arsenite test, which makes it possible to measure separately chloramine and active chlorine, and also to estimate any error which may be due to interfering substances in the treated water.

Inquiries may be addressed to The LaMotte Chemical Products Company, Towson, Baltimore 4, Md.

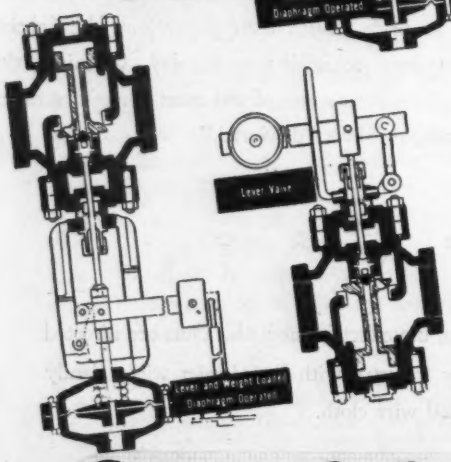
CLOSE CONTROL WITH ACCURATE REGULATION



● Stickle Regulating and Reducing Valves are especially constructed to meet paper mill requirements for exacting control and to supply extreme sensitivity for automatic control with fractional variations in pressures.

The 400 Series

The Stickle Series 400, Single Seated, Balanced Valve opens and closes easily, operates positively—no chatter—and is leak proof. Accommodates full pipe capacities. Maintains constant reduced pressure against variable supply pressure. Renewable valve and valve seats. Main valve and pilot valve and seat may be reground independently. Repairs made without removing bodies from lines. Ask for Bulletin No. 435.



The 200 Series

The Stickle Series 200 Double-Seated, Semi-Balanced Valve is also available in the three designs illustrated. Complete data on these designs and on back pressure and pilot operated valves and float valves in Bulletin No. 235.

OTHER STICKLE EQUIPMENT FOR PAPER MILLS

Stickle Drainage and Control—a complete system making possible maximum efficiency in paper drying with decreased cost of production. Bulletin No. 260.

Stickle Open Float Steam Traps—in series and capacities to meet your specific requirements. Bulletins Nos. 115, 315 and 415.

Stickle Open Coil Feed Water Heater and Purifier—Heats more water in less space. Negligible maintenance. Deaerating and Non-deaerating types. Required sizes—small to large. Ask for Bulletin No. 117.

Stickle

STEAM SPECIALTIES COMPANY

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Stationary Cooking Method

The advent of raw cotton and other fibers in fine paper making has presented problems in the conventional cooking methods. For many years the textile industry has successfully used the indirect, stationary type of equipment for the cooking or boiling of cotton staple and linters for surgical absorbent cotton and cotton batting. An adaptation of this principle is rapidly finding acceptance with the paper companies.

This equipment has a large vertical, full open top pressure vessel with removable cover. Unloading is

accomplished by means of a false bottom grating elevated by an hydraulic lift. The liquors are circulated through a special heat exchanger by an open impeller, centrifugal pump; thence, through the stock. No live steam is admitted to the cook, thereby eliminating dilution and decreasing chemical costs. These units are available and in use now for cooking pressures of 60 p.s.i. with corresponding temperatures of 307°F. They can be furnished for higher temperatures if required.

Another chief advantage of this type of equipment is that during the loading, the stock is thoroughly wet down by the hot caustic liquor and laborious and expensive hand packing is eliminated. The pump circulation permits the closed washing of stock with hot or cold water — a particular advantage in such stock as "blue overall" and others. It is said that higher viscosity stock is obtained through a direct cooking method than that obtained in direct steam injected systems.

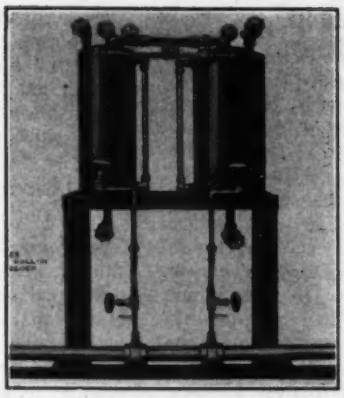
This equipment is manufactured by the William Allen Son's Company of Worcester, Massachusetts, who has over sixty years of experience fabricating fiber treatment equipment. This company also manufactures indirect circulation systems for installation on existing rotaries or bleach boilers.

Steam Protects Machines

Corrosion of steam lines and return condensate piping in plants of the paper industry has been eliminated through the use of an organic chemical treatment proportioned into the steam.

Pulp paper mills on the West Coast have installed H-O-H Model B Feeders to introduce a solution of Organic Glucosates into the steam flow ahead of the drying machines. The proportioning units, being activated by the steam flow through the header, automatically respond to any variation in steam consumption and guarantee accurate and continuous treatment dosages.

The chemical passivates corrosion through the formation of an inhibitor film on the metal surfaces of the system piping. The adsorbed film is of molecular dimension and does not interfere with the transmission of heat through the pipe walls. The solution, dispersed in the vapor, is carried throughout the entire system and is present in the condensate at and after the condensation point thereby maintaining the inhibitor film intact.



Leaks in the heating piping of the drying machines, especially in the U-bends carrying steam or condensate from one set of coils to another, have become forgotten maintenance problems. Shutdowns for repairs with consequent loss of production have been eliminated.

A complete story on this interesting solution to a perplexing problem is to be found in the special "Pacific Northwest Edition" of the H-O-H Lighthouse just off the press. A copy may be obtained from D. W. Haering & Co., Inc., 205 West Wacker Drive, Chicago 6, Illinois.

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Type 10-LS-19
Warren Liquor Pump, Type "L"
Single-stage, Single-suction
WARREN STEAM PUMP CO., INC.
WARREN, MASSACHUSETTS

Kelgin LV an Efficient Size

For obtaining increased brightness on coated paperboard stock, titanium pigment suspended in a Kelgin LV, manufactured by the Kilco company, New York, solution is recommended. Pigments used for this purpose usually are Titanox V30WD or Ti-Bar. These are combinations of approximately 30 per cent titanium dioxide and 70 per cent barium sulphate.

The mixture is usually piped through a water box on one of the topmost nips of the wet calender stack. This position is advised in order to obtain the lowest possible calender pressure and allow the maximum quantity to be retained on the board. It is recommended that this mixture replace the usual water sizing and omit any water sizing ahead of this application.

The cost of this solution is approximately 15c per gallon and one gallon normally covers about 4800 square feet. This coating gives improved printing results and reduces wax penetration for wax coated boards.

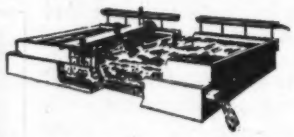
Mathieson Adds to Chlorite Plant

NIAGARA FALLS, N. Y., September 29, 1945—A new plant which will double the output of sodium chlorite is now being added to the production facilities of The Mathieson Alkali Works, according to George W. Dolan, president of the company. Construction cost of the new building is estimated at $35,000 and its total cost at about $323,000. Sodium chlorite was made commercially available by Mathieson in 1940. Since then, its major uses have been as a bleach and oxidant in the textile and paper pulp industries.

The new plant is badly needed, Mr. Dolan said, as present production capacity is far below the demand for sodium chlorite. It is expected that many promising applications will be developed when increased production makes it possible to take care of present markets and supply enough of the chemical for plant scale experimentation.

Hardinge Offers New Sand Filter

The Hardinge Company, Incorporated, York, Pa., has acquired world rights for the manufacture and sale of a new type of automatic backwash sand filter developed since 1940 by W. C. Laughlin. This filter is used mainly for the treatment of sewage, industrial wastes and water supplies, also for the removal of light and fine suspended matter from liquids, not readily removed by sedimentation methods. It has



many specific applications for the removal of such suspended matter from the effluents or overflow discharged by sedimentation units and settling tanks.

The filter consists of a specially compartmented sand bed with underdrains, together with a suitable backwash and cleaning mechanism traveling on tracks on the sidewalls of the filter tank and actuated electrically at predetermined differences in head. It can be supplied in sizes varying from 3 ft. to 16 ft. in width and lengths to suit local conditions; these usually range from 10 to 100 or more feet in length.

WITCO CARBON BLACK No. 11
A special dustless, pelleted black. Cleaner and more efficient than uncompressed types. Easier and more economical to use. Disperses readily throughout pulp. Can be added directly to the beater in the shipping bag.

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Bridge Ramps for Car Loading

Engineered and designed to bridge the gap between loading (dock) platform and car, Elizabeth Iron Works, Green Lane, Elizabeth, N. J., has brought out a new bridge ramp for use with a fork truck as a means of transportation, sizes to span a gap 5 to 46 inches carrying a load of 15,000 lbs. Riding surface is 4-way non-skid checkered plate. Curvature at the top of the ramp permits variance in degrees of height between the loading platform and the car. The lift handles stay up when in use and slide down flush with the riding surface when not in use. Shock plates absorb impact and transmit it to stringer plates which prevent truck and load from running off the sides. The ends of the stringers are set back and rounded off to permit the truck to turn sharp corners. A self-locking device on the sides attached to the stringers, is operated by a heavy tempered steel pin.

Ranney Water Collectors Efficient

The Ranney Water Collector Corporation, 33 West 42 st., New York, has perfected the radial well process through six years' intensive experience to a point where units can be installed at a price lower than ever before. Where ground conditions are proper, water supplied through Ranney collectors is more economical and more satisfactory than by any other method where the demand is large.

Where the static level is encountered within 150 feet from ground level or where pervious material is found adjacent to bodies of water, the system can supply through large amounts of cool, pure water permanently, in a centralized shaft.

Flexbond a New Adhesive

Flexbond, latest in a series of snythetic resins manufactured by the Special Chemicals Company of Cleveland, Ohio, for industrial application is an interesting outgrowth of a war time product. It was originally developed as an adhesive for special paper and fibre board fabrication for the Army in connection with overseas shipments of ammunitions. From this specialized application requiring rigid specifications, it was extended for use in other processes requiring a superior adhesive for use on paper and allied products. In this line it is now available for the various paper industries, including bookbinding, padding and tabbing.

When used in bookbinding, it exhibits unusually fast-setting properties and permanent flexibility. It does not settle, ferment or spoil on standing. When necessary, Flexbond may be colored for specific applications, but it is sold as a milk white emulsion.

Inner Raceway Roller Bearings

McGill Manufacturing Company, Valparaiso, Ind., in its new bulletin IR-45, illustrates and describes new additions to the McGill line of ball and roller bearings. The construction is unique in that the same principle of roller retention is applied as on the solidend multirol bearing construction. End washers or retaining rings are eliminated. End shoulders are built integral with the inner race and rollers cannot fall out. A typical application utilizing this new Inner Raceway Assembly is illustrated in the Bulletin. They are made in both single and double row types.

IN THIS DAY OF VICTORY! ***WE LOOK FORWARD WITH CONFIDENCE TO A FUTURE IN WHICH PEACE SHALL ABIDE.***

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PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
W. L. Cook, Editor

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

Empire State Section. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

Chicago Professional Paper Group. Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

THE MILL NUMBER

Expansion plans already announced, for which estimated cost data has been released by paper and pulp mills, indicates that the United States paper industry will invest a very substantial amount of capital in its post-war building and improvement programs. From reports published in the Paper Trade Journal during the current year to date, the capital expenditures involved in the list of mills we have published amounts to more than $60,000,000. This list is, of course, incomplete, but it does include some of the largest paper manufacturing concerns. Unfortunately it cannot include the many mills which have released expansion plans but have not given any cost data.

In addition to paper and pulp mills, substantial expansion plans have been announced for Canadian concerns. Here again not all the plans announced have supplied cost data, but the amount involved of such concerns as have done so totals to more than $10,000,000.

Also in addition to the mills, a substantial investment has been announced by manufacturers of machinery and equipment for paper and pulp mills. Expenditures for additional building facilities and improvement of existing facilities have been announced by many important chemical concerns which supply raw materials to paper and pulp manufacturers.

As paper is an inexpensive consumers goods line manufactured by mass production methods, costs must ke kept at a minimum in order for mills to make even a relatively low profit on their products in a highly competitive market. Reflecting this past condition, which is certain to return in this post-war period, paper and pulp mills have been very keenly alert to include all the latest improvements, equipment and processes in their expansion program. This necessitates, in the case of the larger and integrated mills, a carefully planned long-range program, which shall include ample supplies of pulpwood, a modern water filtration plant, high pressure boilers, turbines, higher speed Fourdrinier papermaking machines, bleaching plants, the recovery of byproducts and many other kinds of improvements to bring manufacturing facilities up to the present technological and operating standards.

The Crown Zellerbach Corporation in announcing its extensive expansion program last July, will gear its forest growth to the long-range manufacturing program indicated in its new acquisition of timberlands in the Pacific Northwest, which aggregate some 400,000 acres under scientific management. It is estimated that these lands will produce new growth annually approximately equal to the pulpwood requirements of the corporation's five Washington and Oregon plants. The present forest management program will be expanded as labor becomes available, by the conversion of old logging railroad grades into truck roads. These will provide access for tree plantings, transport of fire fighting equipment, systematic thinning and a more complete recovery of non-commercial timber of smaller sizes formerly left in the woods.

The expansion program of the pulp division of the Weyerhaeuser Timber Company, will completely convert one of its sulphite mills to the production of sulphate pulp, and will add to this 90,000-ton annual capacity an entirely new sulphate pulp mill with an annual capacity of 70,000 tons of bleached pulp. The existing sulphite mill will continue to turn out its present tonnage but with 15% less wood, and will supply much of its own power, and without calling for any enlargement of the present areas being logged. This accomplishment will be the fruit of improved and integrated wood utilization practices in forestry, logging and milling.

The Weyerhaeuser program calls for the conversion of the present bleached sulphite mill from a lime base to a magnesium base process. The new process, first commercial installation of its kind, will improve plant efficiency in two ways; by the conversion of organic materials in the waste liquor into steam and power, and recovery of the principal basic chemicals. The waste resulting from the sulphite pulping process has for a long time been known to contain approximately 50% by weight of the raw wood bulk entering manufacture. By converting to the magnesium base process, the company states that it will be economically possible to evaporate the liquor and burn the organic materials for the production of heat and power. At the same time, the new process will also permit recovery of about 90% of magnesium oxide and sulphur. The values so recovered will supply virtually the total heat and power needs of the converted sulphite pulp mill and represents in the opinion of the company, long step forward in wood utilization.

Technological advancements and improved manufacturing operations are very closely associated in the post-war expansion programs of leading paper and

pulp manufacturers. Higher speed papermaking machines, improved processes and the production of different lines of paper and paper products are indicated in the announcements already made by the industry. Plastics will also be included in the plans of many mills, and the St. Regis Paper Company, through its $2,000,000 expansion program of its Panelyte Division, will make this plant one of the most modern in the industry for the mass production of functional insulating parts for the automotive, refrigerator, radio, and electrial industries.

Only a relatively small part of the expansion program now being put into effect in the paper and pulp industry has been briefly mentioned. The future of the paper industry has never appeared more promising. More and better paper products will reach the markets in the future than has ever been possible in the past. The tremendous demand for paper in the war effort has resulted in substantial progress and the extensive research work conducted will be translated into many important improvements in paper goods in the coming years.

Casein Production Lower

WASHINGTON, D. C., November 12, 1945—Dry casein production during September was estimated at 640,000 pounds or 14% lower than a year earlier, the Department of Agriculture reports. September production was the lowest on record for the month since 1922. Stocks on hand of domestic producers at 7,000,000 pounds on September 30 represented a 19% gain from a month earlier but were 32% higher than a year earlier. Domestic casein markets were steady to firm during the last week in October.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
Oct. 6	94.1	Oct. 7	93.4
Oct. 13	96.2	Oct. 14	92.9
Oct. 20	96.5	Oct. 21	90.7
Oct. 27	95.8	Oct. 28	91.3
Nov. 3 (Revised)	97.5	Nov. 4	93.0
Nov. 10	*97.0*	Nov. 11	91.3

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	92.4	88.1
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	88.6	90.2	*95.9*			

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to date	71.1	82.0	86.1	96.6	91.9	88.4	88.5	*89.3*
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

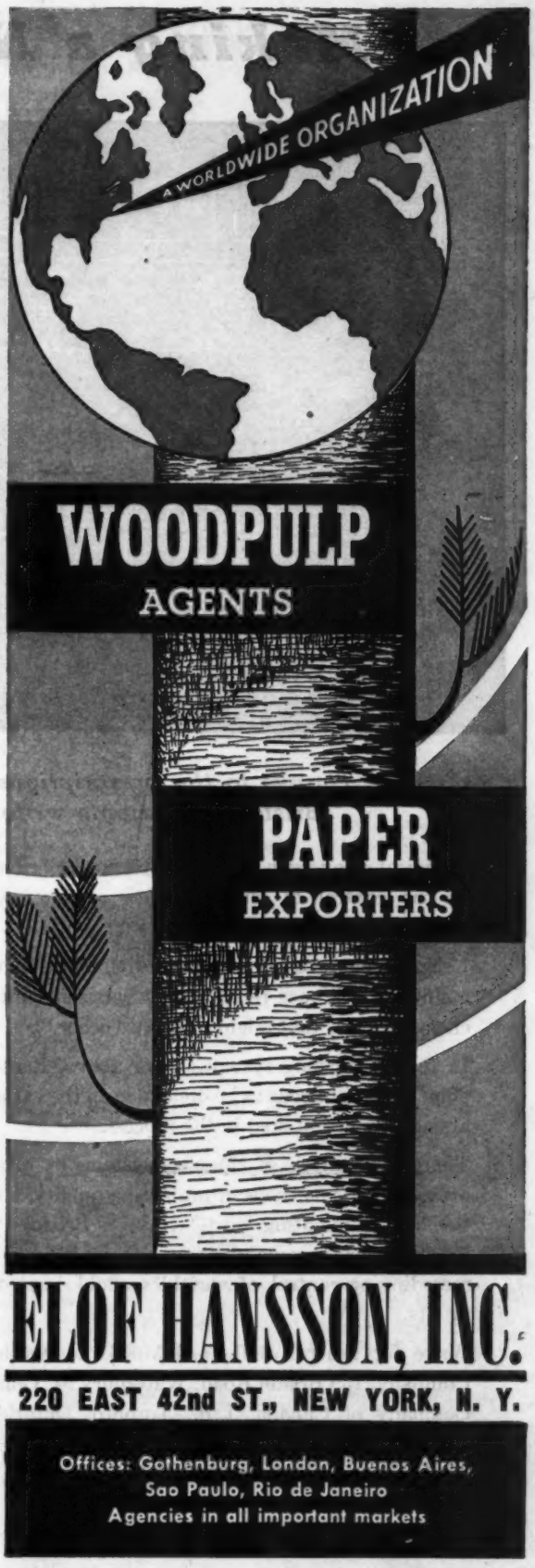
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

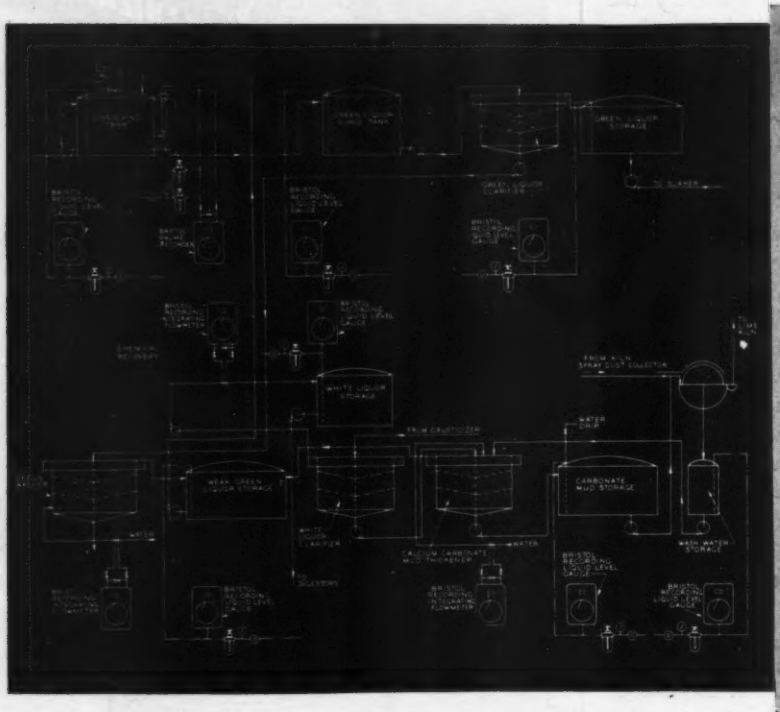
Current Weeks—1945		Corresponding Weeks—1944	
Oct. 6	95	Oct. 7	96
Oct. 13	97	Oct. 14	96
Oct. 20	96	Oct. 21	94
Oct. 27	98	Oct. 28	95
Nov. 3	97	Nov. 4	96
Nov. 10	97	Nov. 11	96

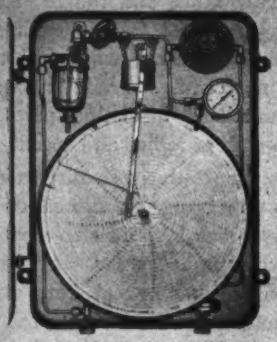
Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	97	97	96	96	86	90	91	97			

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

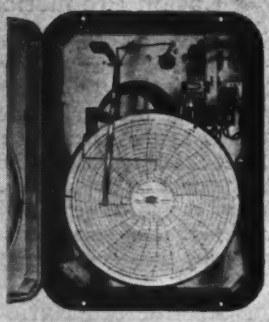


Making a Nice Recovery





Bristol Recording Liquid Level Gauge
Bubbler-type. For any liquid, corrosive or not



Bristol Integrating Flow Meter
Has integrating mechanism for total flow and recording mechanism for rate of flow

. . . *Thanks to the prescriptions these Bristol Instruments write*

Chemical recovery in the Kraft process is efficient in proportion to the control of such variables as flow, liquid level and specific gravity.

Using the charts on Bristol Recording Instruments as a guide to maintaining proper relationships between variables saves the chemical losses that might otherwise occur.

In the causticizing system shown above, Bristol instruments point out what needs to be done to keep the variables in balance at each important step in the process.

Thorough analysis of complete systems by qualified engineers often suggests methods of protecting quality, speeding production and eliminating waste. Have a Bristol Process Control Engineer survey your plant for opportunities where automatic recording or control of variables could improve quality and profits.

Write for general Bulletin DM006, addressing The Bristol Company, 159 Bristol Road, Waterbury 91, Conn. (The Bristol Company of Canada, Ltd., Toronto, Ontario. Bristol's Instrument Co., Ltd., London N.W. 10, England.)

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Edited by R. G. Macdonald, Secretary

Influence of Methylation on Behavior of Paper Fibers Towards Basic Dyes

A Contribution to the Mechanism of Dyeing

By Charles M. Sigvardt[1]

Abstract

Various cellulosic materials and lignins have been methylated and their behavior with basic dyestuffs has been studied. From the results of these dyeings, conclusions are drawn as to the function of the various acidic groups in cellulose and lignin in the dyeing operation and certain deductions are made regarding the dyeing mechanism. These are set forth in the summary and conclusions.

The purpose of this investigation was to determine the mechanism of the dye attachment of basic dyes to cellulose fibers as they exist in pulp. Basic dyes were chosen because they are used to the greatest extent in the paper industry.

Chemically, the basic dyes contain chromophore and auxochrome groups; the latter, or linking group (an amine group) is basic in character. Thus, in order to react, the dye containing an amine group would require an acid group. In native lignin, the phenolic hydroxyl group is the only one having this nature. Lignin, however, as found in sulphite pulp, e.g., contains sulphonic acid groups in the form of the calcium salt. Although this is not a free acid, a definite possibility exists that the calcium base is exchangeable with a dye base. In addition to the production of these groups, more phenolic groups which may be linked with the carbohydrate material in their natural state may be made available in pulping. Some investigators *(1)* believe that acidic carboxyl groups are present in the cellulose molecule itself, whereas others are of the opinion that only the accompanying hemicellulosic material contains this acidic group. At any rate, there is, in general, a belief that carboxyl groups are present in the cellulosic materials, regardless of the extent to which the pulp has been purified. It would seem, therefore, that three types of groups are available for reaction with basic dyes—namely, phenolic, carboxyl, and sulphonic acid groups.

The approach to the problem appeared to be to determine whether or not the acidic groups in cellulosic materials were actually responsible for dyeing. Individual components—i.e., lignin, calcium lignosulphonate, and cellulose—could not be used because the isolation of these components in an unchanged state was impossible, although investigation of these materials for confirmatory evidence would be interesting. Therefore, it was decided that the work, with the exception of holocellulose, would be conducted on pulps which are normally employed in papermaking. The dyeing of native, sulphite, and kraft lignins and their methylated derivatives was also included. It was further decided to cover the acidic groups in such a manner that there would be no change in the physical or chemical properties, except those changes resulting from the introduction of methoxyl groups. To accomplish this purpose, diazomethane methylation was carried out in an ether solution.

If, when these acidic groups were covered, the dye sorption power of the cellulosic materials decreased, the dyeing could be ascribed to the acidic groups in the case of basic dyes.

Historical Review

Wedekind and Garre *(2)* seem to have been the first to investigate the nature of the combination of lignin with dye. They found that "ammonia, alkalies, and basic dyes are very strongly absorbed, this absorption being irreversible, indicating the formation of compounds probably of the molecular type."

Suida *(3)* treated samples of cotton with acetyl chloride, benzoyl chloride, and dimethyl sulphate, substituting one hydroxyl group in each case. He dyed these three materials with a basic dye before and after treatment and could find no difference in their ability to absorb the dye. He concluded from this that the hydroxyl groups of cellulose played no role in dyeing. In these experiments, only a very small part, if any, of the carboxyl groups was covered and, if they had been, neither the method of dyeing nor the method of measurement of dye concentration used at that date (1905) would have been sensitive enough to show the small decrease that would have taken place.

Huseman and Weber *(4)* used Methylene blue sorption to determine the carboxyl content of various cellulosic materials. They postulated that even the most highly purified cellulose contained such groups. From the amount of Methylene blue taken up, they calculated that wood cellulose contains one carboxyl group per 100 anhydroglucose units, whereas cotton

A portion of a thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Doctor of Philosophy from Lawrence College, Appleton, Wisconsin, March, 1944. This work was carried out under the direction of Otto Kress.

[1] Member TAPPI; Technical Director, Marinette Paper Co., Glens Falls, N. Y.

cellulose contains one per 500. Upon methylation of these materials, the glucose number (number of glucose units per carboxyl group) rose to over 2000.

Experimental

Preparation of Raw Materials

The original wood was normal black spruce, extracted with alcohol-benzene, and washed with hot water. This material probably would have properties very similar to groundwood pulp and was used in this study for that reason.

Holocellulose is generally designated as that portion of the wood remaining after chlorination and extraction with an organic base in ethyl alcohol. It represents very nearly the whole of the carbohydrate fraction occurring in the wood. Though generally considered to be lignin-free, holocellulose prepared in the past nevertheless contained a small amount of lignin (usually between 0.3 and 3%, depending upon the species of wood from which it is isolated and the method of preparation). These last traces of lignin undoubtedly could be removed if harsher treatments were used, but such treatments would also remove more carbohydrate material. Therefore, in the preparation of the holocellulose, the chemical treatment was continued to the point at which the maximum amount of carbohydrates remained with the smallest amount of lignin.

Isolation of the holocellulose was accomplished by the method which Thomas *(5)* developed in his investigation of the hemicelluloses of aspen; this utilizes chlorination of wood meal in carbon tetrachloride to remove the bulk of the lignin, with gaseous chlorination *(6)* to remove the last traces. This procedure yields a holocellulose which probably contains as near the total carbohydrate fraction as is possible. Degradation is minimized by keeping the temperature of reaction low; solution of the hemicelluloses is minimized by the use of only small amounts of ice water.

Holocellulose was included in the dyeing experiments to determine what part the carbohydrate fraction played in dyeing, since it contains practically no lignin and nearly all of the carbohydrates of groundwood pulp.

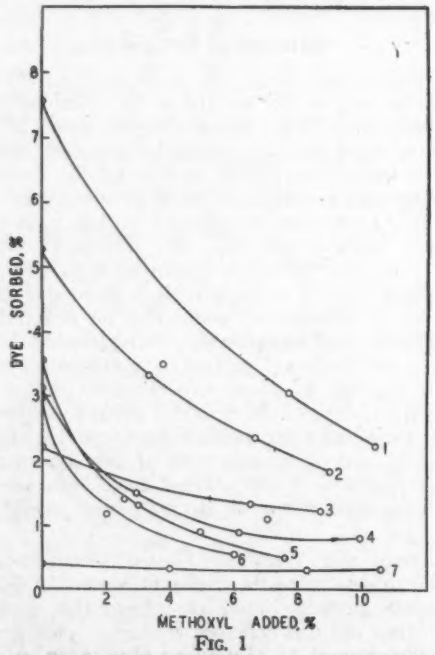

FIG. 1

Change of Dye Sorption with Methylation. 1—Hard Sulphite Pulp. 2—Medium Sulphite Pulp. 3—Sawdust. 4—Soft Sulphite Pulp. 5—Overbleached Sulphite Pulp. 6—Holocellulose. 7—Bleached Sulphite Pulp.

The three sulphite pulps prepared in a pot autoclave represent stocks prepared by three degrees of cooking designed to give pulps of varying lignin contents. Sawdust was used as a starting material to give a maximum of uniformity. The use of three pulps with different lignin contents was intended to show the importance of the lignin in pulp in the sorption of dyes.

Bleached pulp sorbs some basic dye, although in comparison with unbleached pulp the amount is negligible. This pulp, which was prepared by a multistage bleaching procedure to produce a bleached stock with a minimum of degradation, was used to demonstrate that, with practically no lignin present and only small amounts of carboxyl groups in the carbohydrates, dye would still be absorbed.

In order to show the dyeing reaction of carboxyl groups more distinctly, an overbleached pulp was prepared. Similarly, this would demonstrate the effect of methylation more clearly since, with the few carboxyl groups present in bleached pulp, methylation would produce only a slight effect on dye sorption. This pulp was made by use of drastic temperature conditions in order to produce a material relatively high in carboxyl content.

The soda and kraft stocks were included to indicate more clearly the role of the sulphonic acid group of the lignin in sulphite pulp in dyeing. In sulphite pulping, two possible types of groups can be produced: first, the sulphonic acid group and, second, formerly unavailable phenolic hydroxyl groups made reactive by splitting their linkages with the carbohydrates of the wood. In alkaline pulping, only the phenolic hydroxyl groups can be made available. According to Brauns, lignin from alkaline cooking is higher in phenolic hydroxyl content than that from sulphite cooking. Therefore, alkaline pulps having the same lignin content as sulphite pulp should sorb more dye if the sulphonic acid group does not enter into the dyeing reaction. Conversely, if the sulphite pulp does absorb more dye, the sulphonic acid group must enter into the dyeing reaction. These pulps were prepared in a 500-gram pot autoclave, using sawdust as a starting material.

Rag stock which was prepared by the lime-soda process was included to ascertain how a stock which was very low in carboxyl groups would take up dye. This stock was not methylated.

A summary of the properties of the above pulp materials is given in Table I.

TABLE I.—SUMMARY OF PROPERTIES OF MATERIALS

Material	Lignin,* %	Uronic Acid Content* as CO_2, %	Pentosans,* %	Methoxyl Content, % Unmethylated	Methoxyl Content, % Methylated	Methoxyl Added, %
Original extracted wood.	26.5	1.35	11.3	4.70	13.37	8.67
Holocellulose	0.42	1.21	11.2	0.86	6.84	5.98
Soft sulphite pulp	4.23	1.07	...	0.74	10.55	9.81
Medium sulphite pulp	6.67	0.58	...	1.73	10.66	8.93
Hard sulphite pulp	9.68	1.55	...	2.32	12.70	10.38
Bleached sulphite pulp	...	0.35	...	0.25	10.75	10.50
Overbleached sulphite pulp	...	0.81	...	0.31	7.97	7.58
Kraft pulp	10.8	0.57	...	...	...	...
Soda pulp	11.9	0.49	...	...	...	...
Rag stock	...	0.26	...	...	...	...

* Determination on unmethylated material (on moisture-free basis).

Methylation of Cellulosic Materials

The following cellulosic materials, which had been ground in a Wiley mill to pass an 80-mesh sieve, were

methylated with diazomethane in ether because this reagent for methylation, in contrast to dimethyl sulphate, is not likely to cause degradation:

Original extracted wood	Hard sulphite pulp
Holocellulose	Bleached sulphite pulp
Soft sulphite pulp	Overbleached sulphite pulp
Medium sulphite pulp	

Seventy grams of moist material suspended in about 600 ml. of ether were treated with diazomethane in an ether solution *(7, 8)*. After each treatment with diazomethane, the material was placed in a refrigerator at 5° C. and shaken occasionally until the yellow color of the diazomethane disappeared, whereupon it was given an additional treatment. Each material was given 25 treatments, at which stage, 3 to 7 days of standing were necessary for exhaustion.

Methylations in this investigation were carried out on moist materials (approximately 75% moisture-free) in ether suspension. It may be assumed, therefore, that some of the alcoholic hydroxyl groups, as well as the carboxyl groups, were covered. The reason for the use of the moist condition was to accelerate the reaction, which is extremely slow in the anhydrous state. The fact that the material was in suspension and not in solution added to the slowness of the reaction.

In order to determine the change of dye sorption with the addition of methoxyl groups, samples were withdrawn after the 10th, 20th, and 25th methylations and their dye sorption and methoxyl contents determined. Thus, four points were known (0, 10, 20, and 25), which made possible a plot of dye sorption versus methoxyl content added.

Isolation and Methylation of Lignins

Although it was realized that the isolation of the lignins undoubtedly changes their properties from their native state *(10)*, it was believed that a comparison of their dyeing properties would be valuable.

Sulphite and kraft lignins were isolated from their respective pulps by the Willstätter method. This method of isolation was used because the lignins thus obtained are reputedly more reactive than Klason lignin *(9)*. The main purpose of investigating these lignins was to obtain evidence as to whether the sulphonic acid group of the lignin in sulphite pulp reacts with dye. Since sulphonated lignin is acid in contrast to thio lignin and alkali lignin, it should absorb more basic dye. After complete methylation, dyeing should still take place in the sulphite lignin, the dye being attached to the sulphonic acid group which is not subject to methylation by this method, since it is present as the calcium salt. However, with thio lignin and alkali lignin, complete methylation should cover all the phenolic groups and dye should no longer be absorbed.

Diazomethane was passed into a cyclohexanol suspension of these lignins three times. Anhydrous acetone was added and the suspension was centrifuged; this was repeated until all the cyclohexanol had been removed. The lignins suspended in acetone were given four more treatments with diazomethane *(10)*.

Because native lignin is isolated by an inert solvent, it should not be changed chemically, as is the case with the lignins isolated by strong acids or bases. However, it does not represent the total lignin of a wood, probably differing in that it is not linked to the carbohydrates and is of a lower degree of polymerization. For this reason, it may not react exactly like the total lignin of groundwood but, nevertheless, it would serve as an indication of the reactivity with dyestuffs of the unchanged lignin of groundwood pulp.

Preparation of Lignins. The native lignin (0.5 gram) which was prepared by the alcohol-extraction method of Brauns *(11)*, was redissolved in dioxane and methylated with diazomethane produced by the action of 10 ml. of sodium glycolate on 5 ml. of ethyl *N*-nitroso-*N*-methylmethane. The methylated native lignin was precipitated into anhydrous ether, centrifuged, washed with ether and with low and high boiling point petroleum ether, and dried in a vacuum desiccator over concentrated sulphuric acid and paraffin.

After the final methylation, the lignins were filtered on a Büchner funnel, washed with benzene, dioxane, and petroleum ether, and finally boiled in water and filtered. They were dyed in this moist condition.

Complete methylation was not attained. Their methoxyl contents are given in Table II.

Brauns *(11)*, when methylating native lignin with diazomethane in an anhydrous dioxane solution, found that only one hydroxy group was covered and this he postulated to be the phenolic hydroxyl group. Under the conditions used in the present investigation, phenolic groups probably would be methylated.

Although many investigators believe that cellulose does not contain acid carboxyl groups in its native state, it at least is accompanied by materials such as polyglucuronic acids and other hemicelluloses which are inseparable from it and which contain carboxyl groups. These carboxyl groups are capable of methylation even in an anhydrous medium.

Determination of Dye Sorption

Dropping Method. This procedure, which was described and used by Huseman and Weber *(4)*, consists of dropping dye on a pad of material and sucking the dye through, thereby removing the acid part of the dye molecule as soon as it is liberated. Determinations were made as follows:

One-tenth gram of material was placed in a 3-ml. fritted glass filter tube which was mounted in a suction flask. Dye (0.04 gram per liter) was dropped into the filter tube by means of a separatory funnel, keeping the material covered with dye at all times. The suction was adjusted so that approximately 2 drops of dye were removed per second. In order to prevent channelling, a piece of fine wire was used to stir the material. Dye was added until the filtrate was of the same depth of color as the original dye, after which an additional 25 ml. of dye were sucked through. The total volume of the dyestuff solution added was recorded. The dyed material was washed with about 50 ml. of distilled water, or until the wash water was no longer colored. The combined filtrates from the dyeing and the washing were diluted to a definite volume in a volumetric flask.

Following the method of Huseman and Weber *(4)*, 0.02 *N* hydrochloric acid was dropped on and sucked through the dyed material in the same manner as in the dyeing. When the acid filtrate was colorless, a few milliliters of water were added to wash out the acid. The acid filtrate and the water wash were combined and diluted to a definite volume in a volumetric flask, adding sufficient 0.02 *N* hydrochloric acid to make the concentration 600 ml. per liter.

TABLE II

Lignin	Methoxyl Content, %	
	Unmethylated	Methylated
Native	14.0	18.7
Kraft	12.51	19.10
Sulphite	4.07	6.96

Suspension Method of Dyeing in the Presence of Size and Alum. This procedure was used to approximate the conditions of commercial dyeings.

One and one-half grams of finely divided material were suspended in 100 ml. of distilled water. Fifteen ml. of dye (0.4 gram per liter) were added and the suspension was stirred for 10 minutes with a mechanical stirrer. Rosin size (3 grams per liter of rosin) equivalent to 2% on the air-dry weight of the pulp was pipetted into the mixture and stirring was continued for another 5 minutes, whereupon enough alum was added to bring the pH to 4.75 ± 0.1 (a glass electrode was used to determine the pH value). After standing for 5 minutes, the suspension was filtered on a fritted glass crucible and the dyed material was washed with water to a total volume of about 250 ml. The white water (filtrate) was diluted to exactly 250 ml. in a volumetric flask.

Suspension Method Dyeing of Lignin. Sufficient dye (0.04 gram per liter) was added to the lignin contained in a centrifuge bottle to make a 10-pound dyeing (1% on the weight of the moisture-free lignin). The lignin suspension was stirred for 10 minutes with a malted milk mixer and allowed to stand for 2 hours, whereupon it was centrifuged, the supernatant liquor was poured into a volumetric flask, and the dyed lignin was washed with water until a total volume of 250 ml. resulted.

Calculation of Dye Sorption. All dye solutions and filtrates were measured for their transmittance values on the General Electric recording spectrophtometer. Transmittance values were taken at the wavelength of maximum absorption for the dye being measured.

From the transmittance value, the concentration in grams per liter could be found by reference to a chart in which log $1/T$ (T being transmittance) was plotted against the concentration in grams per liter. These charts were obtained by measuring the transmittance values of known concentrations (concentrations of 0.0008, 0.0016, 0.0032, 0.0064, 0.0096, 0.0128, and 0.0160 gram per liter being the standards). Two sets of standards were run: one diluted with water, the other with sufficient 0.02 N hydrochloric acid to make the concentration of this acid 600 ml. per liter. Typical calculations are given below:

Sample	T	$1/T$	Log $1/T$	Volume, ml.	Concentration, g./l.$\times 10^3$	Amount Present, g.$\times 10^3$
Standard	6.9	14.493	1.161	500	12.15	6.08
Example	25.9	3.861	0.587	250	5.90	1.48

Each day a dyeing was made, one sample to which a definite amount of dye had been added was measured for transmittance. The concentration of this standard was read from the graph and this concentration taken to determine the amount of dye added in the dyeings for that day. As an example, the standard in the above table contained 0.00608 gram per liter of dye; 150 ml. of dye prepared that day had been added to make this standard. Thus, if 100 ml. of dye had been used in one determination, the amount of dye added would be 0.00406 gram. This use of standards served to correct for errors made in weighing and to make one day's results comparable with those of another.

In determining the amount of dye sorbed in the dropping method, the amount of dye added was known and the amount of dye not taken up was found by measuring the transmittance of the filtrate and obtaining the concentration of the dye solution from the standardization charts. By subtracting the amount of dye in the filtrate from the amount added, the dye sorbed was found. The percentage of dye absorbed was determined as follows:

$$\% \text{ Sorbed} = \frac{\text{Grams of dye sorbed}}{\text{Weight of sample} \times \text{moisture-free fraction}}$$

The amount released by the hydrochloric acid wash was found by obtaining the dye concentration from the standardization charts. From the concentration in grams per liter, the amount present was calculated. A sample calculation for the dropping method is given below:

Sample	Amount Added, g.$\times 10^3$	Amount Present, g.$\times 10^3$	Amount Sorbed, g.$\times 10^3$	Amount Released, g.$\times 10^3$	Amount Remaining, g.$\times 10^3$
1M	1.85	0.80	1.05	1.02	0.03

The amount sorbed in the suspension method was determined similarly. From the standard, the amount of dye added was known. Measurement of the filtrate gave the amount of dye not sorbed by the material. Subtracting these gave the amount of dye sorbed. The percentage retention was calculated by dividing the amount of dye sorbed by the amount of dye added.

In the case of Methylene blue, duplicate determinations were made. Single determinations were made for all other dyes.

Discussion of Dyeing Procedure. A commercial basic dye is the acid salt of a basic organic compound, such as the hydrochloride, the oxalate, or the double zinc salt. It has been found *(12)* that, when a dye is taken up by a fiber, the organic dye radical of the molecule is retained, leaving the acid radical in solution; this results in the following equilibrium reaction:

$$\text{Dye.HCl} + \text{Fiber} \rightleftarrows \text{Dye.Fiber} + \text{HCl}$$

When the hydrochloric acid reaches the concentration set by the equilibrium no more dye can be absorbed. Therefore, the total amount of dye which the fiber is capable of taking up cannot be absorbed when the hydrochloric acid is not removed from the dye bath.

The dropping method was designed to shift this equilibrium, by removal of the hydrochloric acid as soon as formed by drawing it through the dyed stock using suction. This method, then, is a measure of the ultimate dye sorption power of the material.

It should be pointed out that the amounts absorbed in the case of the dyeings made by the dropping method were abnormal from the standpoint of mill practice, a 76-pound dyeing (7.6% or 76 pounds of dye per 1000 pounds of stock, as it would be recorded in commercial dyeing) being approximately seven times greater than the heaviest mill dyeings. This large amount indicated the ultimate absorption ability of hard sulphite pulp and was only possible because the hydrochloric acid given off as the dye was absorbed was removed as soon as it was released, with the result that the absorption of dye was not inhibited.

Huseman and Weber *(4)*, in their work which was concerned with the number of carboxyl groups in cellulose, postulated that all dye absorbed by cellulosic materials which they investigated could be removed by dilute hydrochloric acid. However, the materials which they used contained little or no lignin. In the present study, it was thought that the dye released by the hydrochloric acid could be used as a measure of the fraction of the dye sorbed by the carboxyl groups of the cellulosic materials.

In order to obtain a relationship to commercial dyeing, the suspension method was used for all dyes and materials. In this determination, the dye, size, and

alum were added in the order given, which is the usual order of addition in mill practice.

The addition of size and alum introduced further complications because the components of the sizing agent (such as rosin size, sodium resinate, and alumina) may act as a mordant and because alum alone will change the pH conditions and shift the equilibrium reaction previously discussed to the left. Therefore, these two methods may or may not give comparable results.

In order to cover the basic dyes as completely as possible, one member from each of the types of basic dyes used in commercial practice was studied. These dyes were Chrysoidine, Rhodamine, Methyl violet, Safranine, Methylene blue, and Auramine. A discussion of Methylene blue only will be included since all materials, both unmethylated and methylated and at all intervals of methylation, were treated with this dye; therefore, the data are most complete for Methylene blue. Further, the results obtained with the various dyes were, in general, similar enough so that the interpretation of the results secured with Methylene blue may be applied to other dyes. The notable exception was Rhodamine B, which, in contrast to the other dye, contains a carboxyl group.

The column "percentage sorbed" (Tables III-V) was obtained by subtracting the amount of dye left in the filtrate from the amount of dye originally added; "percentage released" was determined by measuring the concentration of the acid wash filtrate; and "percentage retained" was calculated by subtracting the "percentage released" from "percentage sorbed."

In all cases except that of the bleached pulp the capacity for absorbing dyes decreased sharply upon methylation. The decrease was rapid at first, but became less rapid as more methoxyl groups were added.

The sulphite pulps absorbed dye in proportion to their lignin content. After the 25th methylation, the amount of dye taken up was still decreasing and the values seemed to be related to their lignin contents, although not as widely divergent from one another as in the unmethylated condition. This would indicate that more acidic hydroxyl groups were preferentially covered in the early stages of methylation. Whether the sorption of these three pulps would eventually go to zero is a matter of conjecture, since calcium lignosulphonic acid groups were still present. Therefore, if they do play a role in dyeing, as later indications show, the curves would not reach zero but would flatten out at a value corresponding to the amount of dye capable of being sorbed by these groups. The fact that the sorption values of the three pulps had not become more nearly equal after the final methylation indicated the existence of a group incapable of being methylated which would absorb dye.

Materials containing predominantly carboxyl groups declined quite rapidly in the amount of dye sorbed during the early stages of methylation, then began to level out, and approach the sorption values of bleached pulp. The behavior of bleached pulp was very interesting, in that the addition of 10.50% methoxyl caused very little change in dye sorption in comparison with the large decrease in the case of overbleached pulp which added 7.58% methoxyl. This indicated that alcoholic hydroxyl groups, which were present in approximately the same amounts in both pulps, play no role in dyeing, even though some changes in the physical properties would probably

TABLE III.—CHANGE OF DYE ABSORPTION UPON METHYLATION

Material	Dye Sorbed,* %	Dye Released,* %	Dye Remaining,* %	Methoxyl Added, %	Methoxyl Content, %
		Original Extracted Wood			
0-M **	2.2	1.6	0.6	....	4.70
10-M	1.5	1.0	0.5	2.96	7.66
20-M	1.3	1.1	0.2	6.49	11.19
25-M	1.2	1.1	0.1	8.67	13.37
		Holocellulose			
0-M	2.9	2.7	0.2	....	0.86
10-M	1.2	1.1	0.1	2.06	2.92
20-M	0.9	0.7	0.2	4.93	5.79
25-M	0.6	0.6	0.0	5.98	6.84
		Soft Sulphite Pulp			
0-M	3.1	2.2	0.9	....	0.74
10-M	1.4	1.1	0.3	2.61	3.35
20-M	1.1	0.9	0.2	7.03	7.77
25-M	0.8	0.6	0.2	7.81	10.55
		Medium Sulphite Pulp			
0-M	5.2	3.3	1.9	....	1.73
10-M	3.3	2.8	0.5	3.36	5.09
20-M	2.3	2.0	0.3	6.66	8.38
25-M	1.8	1.3	0.5	8.93	10.66
		Hard Sulphite Pulp			
0-M	7.6	4.5	3.1	....	2.32
10-M	3.4	2.7	0.7	3.83	6.15
20-M	3.0	2.6	0.4	7.72	10.04
25-M	2.2	1.9	0.3	10.38	12.70
		Bleached Sulphite Pulp			
0-M	0.4	0.3	0.1	....	0.25
10-M	0.3	0.2	0.1	4.05	4.30
20-M	0.3	0.2	0.1	8.26	8.51
25-M	0.3	0.2	0.1	10.50	10.75
		Overbleached Sulphite Pulp			
0-M	3.5	3.0	0.5	....	0.31
10-M	1.3	1.1	0.2	3.04	3.43
20-M	0.9	0.7	0.2	6.16	6.55
25-M	0.5	0.4	0.1	7.58	7.97

* Percentage based on the weight of the wood.
** 0-M, 10-M, etc., indicate 0, 10, or more methylations. All results are for Methylene blue ZX.

TABLE IV.—COMPARISON OF DYE SORPTION BEFORE AND AFTER METHYLATING TWENTY-FIVE TIMES

Sample	Dye Sorbed, %		Dropping Method * Dye Released, %		Dye Retained, %		Suspension Method ** Dye Retained, %	
	Unmethylated	Methylated	Unmethylated	Methylated	Unmethylated	Methylated	Unmethylated	Methylated
			Methylene Blue ZX					
Original wood (extracted)....	2.2	1.2	1.6	1.1	0.6	0.1	92.5	67.5
Holocellulose	2.9	0.6	2.7	0.6	0.2	0.0	82.5	57.5
Soft sulphite pulp.....	3.1	0.8	2.2	0.6	0.9	0.2	95.0	75.0
Medium sulphite pulp.....	5.2	1.8	3.3	1.3	0.9	0.5	95.0	92.5
Hard sulphite pulp.....	7.6	2.2	4.5	1.9	3.0	0.3	97.5	92.5
Bleached sulphite pulp.....	0.4	0.3	0.3	0.2	0.1	0.1	50.0	35.0
Overbleached sulphite pulp...	3.5	0.5	3.0	0.4	0.5	0.1	82.5	67.5
Kraft pulp	3.3	..	2.7	..	0.6	..	95.0	...
Soda pulp	2.4	..	2.4	..	0.0	..	95.0	...
Rag stock	0.2	..	0.2	..	0.0	..	35.0	...
			Safranine T Extra					
Original extracted wood.....	3.0	1.4	1.9	1.1	1.2	0.4	91.1	78.8
Holocellulose	3.7	0.8	3.5	0.8	0.2	0.0	74.8	55.7
Soft sulphite pulp.....	3.1	0.9	1.8	0.7	0.3	0.2	91.6	80.8
Medium sulphite pulp.....	6.5	2.1	2.8	1.7	3.7	0.4	93.9	89.8
Hard sulphite pulp.....	9.6	2.5	5.4	1.8	4.2	0.7	96.4	92.4
Bleached sulphite pulp.....	0.4	0.2	0.4	0.2	0.0	0.0	57.4	48.2
Overbleached sulphite pulp...	3.3	1.1	3.0	0.9	0.3	0.1	85.6	63.3
Kraft pulp	4.0	..	3.3	..	0.7	..	91.5	...
Soda pulp	3.4	..	2.5	..	0.8	..	94.8	...
Rag stock	0.2	..	0.2	..	0.0	..	41.9	...

* Percentage based on the weight of the wood.
** Percentage based on the total amount of dye added (0.4 gram per 100 grams of pulp)—e.g., if 0.3 gram of a dye was retained, the percentage retention would be 75%.

take place with the addition of such a large percentage of methoxyl groups.

Table IV, in which are recorded the dye sorption values of Methylene blue ZX on unmethylated pulps, indicates that hard sulphite pulp absorbed the largest amount of dye—i.e., 7.6%, with medium and soft sulphite pulps absorbing 5.2 and 3.1%, respectively. Overbleached pulp absorbed slightly more than soft sulphite pulp (3.5%); however, washing with acid released most of the dye (3.0% as compared with 2.2% in the case of soft sulphite pulp), indicating that carboxyl groups, although absorbing large amounts, do not form as stable bonds as those of the lignosulphonic acid. Holocellulose sorbed almost as much dye as soft sulphite pulp, but released it readily when washed with acid, as did the overbleached pulp.

Sulphate and soda pulp containing 10.8 and 11.9% lignin, in comparison with 9.68% lignin in hard sulphite pulp, took up much less dye. As can be seen from Table IV, hard sulphite pulp absorbed 7.6%, or more than twice as much dye as kraft and soda (3.3 and 2.4%, respectively). As mentioned earlier, kraft and soda lignin are believed to contain as much phenolic constituent, if not more, than the lignin of sulphite pulp. Therefore, with approximately equal amounts of lignin, as is the case with these three pulps, kraft and soda pulps should have absorbed at least as much dye. That the carboxyl groups were not responsible, is indicated by the amounts retained after washing with hydrochloric acid. It appears, therefore, that other groups were responsible, which further substantiates the theory that the sulphonic acid group plays a role in dyeing sulphite pulp by ion exchange of the dye base with the calcium ion of lignosulphonic acid.

TABLE V.—COMPARISON OF DYE SORPTION BEFORE AND AFTER METHYLATING TWENTY-FIVE TIMES

Sample	Dropping Method * Dye Sorbed, %		Suspension Method ** Dye Retention, %	
	Unmethylated	Methylated	Unmethylated	Methylated
	Methyl Violet			
Original extracted wood	2.4	1.8	93.5	68.7
Holocellulose	2.4	1.1	81.0	54.5
Soft sulphite pulp	3.4	1.0	91.8	88.4
Medium sulphite pulp	6.5	2.4	94.2	93.3
Hard sulphite pulp	8.7	2.5	98.2	93.4
Bleached sulphite pulp	0.3	0.2	69.0	65.0
Overbleached sulphite pulp	2.1	1.0	92.0	72.7
Kraft pulp	4.5	..	95.1	...
Soda pulp	3.7	..	97.7	...
Rag stock	0.2	..	56.2	...
	Auramine			
Original extracted wood	1.8	1.0	89.7	74.5
Holocellulose	1.3	0.6	54.2	21.3
Soft sulphite pulp	1.8	0.4	84.6	63.4
Medium sulphite pulp	4.6	1.0	93.4	85.6
Hard sulphite pulp	5.4	1.2	93.8	87.0
Bleached sulphite pulp	0.1	0.0	29.5	25.4
Overbleached sulphite pulp	0.5	0.0	61.5	24.9
Kraft pulp	2.4	..	89.6	...
Soda pulp	2.2	..	90.5	...
Rag stock	0.1	..	28.2	...
	Rhodamine B			
Original extracted wood	0.3	0.4	75.6	62.3
Holocellulose	0.0	0.0	30.3	14.3
Soft sulphite pulp	0.1	0.1	67.2	57.6
Medium sulphite pulp	0.4	0.1	82.6	76.7
Hard sulphite pulp	0.3	0.1	90.2	70.4
Bleached sulphite pulp	0.0	0.0	95.0	14.3
Overbleached sulphite pulp	0.0	0.0	48.5	23.8
Kraft pulp	0.6	..	92.0	...
Soda pulp	0.5	..	93.7	...
Rag stock	0.0	..	35.8	...
	Chrysoidine GN			
Original extracted wood	1.9	1.1	78.8	57.8
Holocellulose	0.8	0.1	38.5	23.7
Soft sulphite pulp	1.1	0.3	60.2	44.2
Medium sulphite pulp	3.5	1.0	87.6	69.6
Hard sulphite pulp	3.3	1.0	89.2	67.8
Bleached sulphite pulp	0.2	0.0	22.9	25.8
Overbleached sulphite pulp	1.1	0.1	91.3	32.9
Kraft pulp	1.4	..	70.3	...
Soda pulp	1.3	..	72.0	...
Rag stock	0.0	..	20.7	...

* Percentage based on the weight of the wood.

** Percentage based on the total amount of dye added (0.4 gram per 100 grams of pulp)—e.g., if 0.3 gram of dye was retained, the percentage retention would be 75%.

The original extracted wood absorbed less dye than the holocellulose. In the case of the latter, practically all of the lignin with its phenolic hydroxyl groups had been removed. Furthermore, some of the uronic acids are no longer present, as shown by the analysis recorded in Table I. From a study of these data, it would seem that the amount of dye which would be absorbed should decrease. However, some of the phenolic hydroxyl groups and the carboxyl groups, as they existed in the original wood, were linked in some way with other groups so that they were unreactive toward dye. Meyer *(13)* believes that the most likely linkage between lignin and carbohydrates is through the phenolic hydroxyl groups in the lignin. In the case of carboxyl groups, he postulates that the carboxyl groups form esters with the alcoholic hydroxyl groups of the neighboring cellulose chains. The larger amount of sorption of holocellulose, as compared with the original wood, indicates that the carboxyl groups were linked in some way, either to the cellulose or to the lignin, or that they existed as lactones. Similarly, phenolic groups of the lignin must have been linked in the original wood or a great decrease in dyeing power would have taken place.

As can be seen from the column "percentage sorbed" of the methylated materials (Table IV), the dye sorbed is less than that sorbed by the original unmethylated material in every case. The decrease for bleached sulphite pulp was the least (from 0.3 to 0.2% or a decrease of 0.1%). This has been discussed previously. The fact that only the carboxyl groups enter into the dyeing of nonlignified cellulosic materials was substantiated by the large decrease in the case of the overbleached pulp and the holocellulose, together with the small decrease in the case of bleached pulp.

Of the sulphite pulps, that containing the largest percentage of lignin decreased the most and the soft sulphite pulp decreased the least.

The original wood decreased in dye sorption considerably upon methylation, although not as markedly as the sulphite pulps. This smaller decrease may have been because of the fact that the carboxyl groups are unreactive toward methylation by existing as the salt of a metallic ion which would not affect a blocking of dye. Further substantiation of this fact may be interpreted from the large amount released by the acid wash, indicating that carboxyl groups had combined in large proportions with the dye. Thus, in dyeing methylated groundwood, the lignin played only a small role in the dyeing, whereas the carboxyl groups accounted for the greater part of the dye absorbed.

The results obtained with the suspension method were calculated as percentage retention—since this is the customary nomenclature in commercial dyeing—of the 4 pounds (0.4% on the weight of the material) of dye added.

The results obtained with this procedure did not exactly follow those secured with the dropping method. However, hard sulphite pulp was the highest in power of sorption in both cases. The fact that the variations among the pulps were not as great with the suspension method as with the dropping method can be explained by the observation that the ultimate sorption (from dropping method results) was much greater in every case than the percentage retained with the suspension method. With the exception of the bleached pulp and rag stock, the materials dyed were capable of absorbing at least five times the amount added if the hydrochloric acid formed during the dyeing had been removed.

The different order of absorption evident when the two methods are compared was true only when the pulps containing carboxyl groups exclusively and those containing lignin were considered together. Lignified materials as a group follow the general trend as shown below:

Material	Dropping Method Dye Sorbed, %	Suspension Method Dye Retention, %
Hard sulphite pulp	7.6	97.5
Medium sulphite pulp	5.2	95.0
Kraft pulp	3.3	95.0
Soft sulphite pulp	3.1	95.0
Soda pulp	2.4	95.0
Original extracted wood	2.1	92.5

Likewise, the nonlignified materials showed a correlation between the two methods:

Material	Dropping Method Dye Sorbed, %	Suspension Method Dye Retention, %
Overbleached pulp	3.5	82.5
Holocellulose	2.9	82.5
Bleached pulp	0.4	50.0
Rag stock	0.2	35.0

The fact that the results obtained with both methods do not fall in line when all materials are considered, can be ascribed to the sensitivity of dye absorbed by the carboxyl groups to acid and also, therefore, to the pH of the suspension. The addition of acid may cause a decrease in the ionization of the weakly acidic group of the cellulosic materials as well as an increase in the solubility of the complex formed between the material and the dye:

$$\text{Material.H} \rightleftarrows \text{Material}^- + (\text{H})^+$$
$$\text{Dye.Cl} \rightleftarrows \text{Dye}^+ + (\text{Cl})^-$$
$$\text{Material}^- (\text{H})^+ + \text{Dye}^+ (\text{Cl})^- \rightleftarrows \text{Material.Dye} + \text{HCl}$$

This observation has been made previously in that basic dyes are sorbed to a greater extent when dyeings are made at higher pH values. Since in the suspension method the pH was maintained at 4.75, the equilibrium mentioned previously would be forced toward the left, not allowing as much dye to be absorbed by the carboxyl groups. This apparently was not as critical in dye combinations with lignin, as shown by the smaller fraction which was washed out of lignified fibers.

An interesting sidelight developed in dyeing by the suspension method from the standpoint of the amount of alum necessary to bring the pH to 4.75. Following are the milliliters of alum which were required to bring the suspension to the correct pH as measured by the glass electrode:

Sample	Alum Used, ml. Unmethylated	Alum Used, ml. Methylated
Original extracted wood	3.0	4.0
Holocellulose	3.0	4.0
Soft sulphite pulp	4.5	8.0
Medium sulphite pulp	3.0	8.5
Hard sulphite pulp	6.5	13.5
Overbleached pulp	6.5	9.0
Bleached pulp	2.5	5.0
Kraft pulp	6.5	..
Soda pulp	6.5	..
Rag stock	3.0	..

Thus, on methylation, enough of the acidity of the material was cancelled to give a noticeable difference in the amount of alum necessary to bring the pH to the same value.

Dyeing of Lignins with Methlene Blue ZX

The results obtained from the dyeing of lignins, using 10 pounds of Methylene blue (1% on the moisture-free weight of lignin) are indicated below:

Lignin	Unmethylated Retention, %	Methylated Retention, %
Kraft	75.5	20.0
Sulphite	96.0	96.0
Native	65.5	13.0

Although these lignins were not completely methylated, definite trends were evident. In the case of the unmethylated lignins, the sulphite lignin retained the greatest amount of dye and native lignin the least. The purity of this sulphite lignin was questionable, since it contained only 4.07% methoxyl (methoxyl is used generally as a measure of purity). Phillips *(9)* states that lignin isolated by the Willstätter method is liable to contain cellulose. Assuming the impurities to be cellulose, the retention would be greater if this impurity were removed, provided, of course, that the cellulose was not rich in carboxyl groups. If it did contain a number of carboxyl groups, the methoxyl content upon methylation would probably have increased more than it did—i.e., 2.89% as shown by Table II. Therefore, because the sulphate lignin contained at least as many phenolic hydroxyl groups, if not more (as indicated by its greater increase in methoxyl content on methylation), the large absorption of dye by the sulphite lignin shows that sulphonic acid groups do play a role in the dyeing of sulphite pulp.

Further substantiation of the above was indicated by the sorption values after methylation. In all cases except that of the sulphite lignin, the percentage retention decreased upon methylation. It would seem, therefore, that the sulphonic acid groups in sulphite lignin and also in sulphite pulp are the principal groups entering into the dyeing reaction of this pulp.

General Discussion of Dyeing Results

That the dyes did not combine in proportion to their molecular weight may be due to the complexity of the dye molecule, as postulated by Bary *(14)*, who stated that the apparent lack of adherence to laws of chemical combination may result from the fact that dyes contain many radicals which may give rise to complex solubility phenomena. All dyes differ widely in their structure, both in their nucleus and in the number and type of linking (amine) groups. Chrysoidine, an azo dye, contains two primary amine groups; Safranine, an azine dye, two primary amine groups; Methyl violet, a triphenylmethane dye, one secondary and two tertiary amine groups; Methylene blue, a thiazine dye, two tertiary amine groups. Therefore, it is evident that the basicity of these dyes varies greatly. Further, in none of these dyes can chemical combination for all possible dyeing conditions be postulated to take place through any one definite group. Whether one amine group or another, or combination of amine groups of the dye, act as the linking groups undoubtedly depends on the type and amounts of the different groups in the material being dyed, as well as on the pH and sizing conditions.

Although the dyes did not combine according to molecular weight, it seemed to be of interest to calculate the approximate molecular relationship. Hard sulphite pulp, e.g., absorbed 9.6% of Safranine (molecular weight, 350) on the weight of the moisture-free pulp, or 0.027 mole of dye per 100 grams of pulp. In this pulp there was 9.48% lignin. If each lignin structural unit contained one phenolic hydroxyl and one sulphonic acid group (it probably contains less), there would be 0.011 mole of each of these to react with the dye. This value was obtained by assuming a weight of 840 for the lignin building unit. In the carbohydrate fraction, the uronic acid content (expressed as carbon dioxide) was 1.55% or 0.035 mole of carboxyl groups. This last figure undoubtedly included substituted carboxyl groups incapable of

reacting with the dye, because analysis by this procedure determines not only free uronic acids, but also lactones formed from uronic acids. A summation of these gives a maximum of 0.011 + 0.011 + 0.035 or a total of 0.057 mole of acidic groups to react with the dye. In the case of this particular dye (Safranine), 0.027 mole of dye per 100 grams of pulp was absorbed. Thus, it can be seen that there was an abundance of available reactive groups in the sulphite pulp to react with the dye.

Following is a list of the number of moles of each dye sorbed by 100 grams of hard sulphite pulp:

Dye	Mole
Methylene blue ZX	0.025
Safranine T extra	0.027
Chrysoidine	0.014
Methyl violet	0.019
Auramine	0.017

It should be emphasized again that the amounts of dye taken up by the dropping method were abnormal. An average commercial dyeing to produce a sheet of high tinctorial strength would be 4 pounds or 0.4%; therefore, instead of 0.026 mole of dye per 100 grams of pulp being added, this figure would be nearer 0.001 mole.

From the above discussion, it is evident that the quantities dealt with were extremely small and that only minute amounts of impurities are necessary to give pulp sufficient combining power for a very strong dyeing.

Summary and Conclusions

The following cellulosic materials were methylated with diazomethane in ether suspension:

1. Original extracted wood (corresponding to groundwood)
2. Holocellulose
3. Soft, medium, and hard sulphite pulps
4. Bleached sulphite pulp
5. Overbleached sulphite pulp

Dyeings were made before and after 25 methylations on the above materials and also on sulphate and soda pulps and rag stock, but these materials were not methylated. The dyes which were employed in this investigation were Methylene blue ZX, Safranine T extra, Auramine, Methyl violet, Chrysoidine GN, and Rhodamine B, which cover the range of all the common types of basic dyestuffs used in papermaking.

Native lignin and lignins from sulphite and sulphate pulps were prepared by the Willstätter method and partially methylated. Dyeing experiments were carried out on these products using Methylene blue ZX.

From the results obtained in the above experiments the following conclusion may be drawn:

The dye sorbed by cellulosic materials decreased with the introduction of increasing amounts of methoxyl groups. In the case of Methylene blue ZX, using an overbleached stock, a decrease to one-seventh of the original dye sorption occurred, whereas with bleached stock the final value was two-thirds of the original value. These two examples represent the extremes of decrease in dye sorption.

Because methylation of the acidic groups (i.e., the carboxyl of the carbohydrate fraction and the phenolic hydroxyl groups of the lignin of the pulps) caused a substantial decrease in dye absorption, these groups are contributory to the absorption of basic dyes by pulps. Because sulphite pulp having the same lignin content as soda and kraft pulp absorbed at least twice the amount of dye, the sulphonic acid groups which exist only in sulphite pulp lignin must also play a major role in dyeing. Further substantiating this, methylation of lignin isolated from sulphite pulp did not decrease the percentage of dye retained, whereas native lignin and lignin from sulphate pulp showed a decrease. This does not mean, however, that the phenolic hydroxyl groups of the sulphite lignin do not enter into the dyeing reaction because in the suspension method (which was used in the dyeing of lignins) only a limited amount of acidic groups is needed to react, since the amount of dye that is added is small in proportion to the ultimate ability of the material to take up dye.

In view of the fact that sulphite, soda, kraft, groundwood, and overbleached pulps vary in the ease and amount of dye split off when washed with hydrochloric acid, the complexes formed in dyeing vary in stability. Results of the dyeing experiments indicated that sulphonic acid groups were the most stable, phenolic hydroxyl groups next, and carboxyl groups the least.

A corollary of the above statements is that the acidity produced in commercial dyeings by alum shows the greatest effect on the dye retention of the carboxyl groups and the least on that of the sulphonic acid groups.

When pulp is dyed in a suspension, as in commercial practice, the maximum amount of dye is not absorbed because the following equilibrium occurs:

$$\text{Dye.HCl} + \text{Fiber} \leftrightarrows \text{Fiber.Dye} + \text{HCl}$$

When the concentration of the acid reaches a certain value, no more dye can be absorbed. This postulation is supported by the fact that, in the dropping method, where the hydrochloric acid is removed upon formation, 7.6% (76 pounds of dye per 1000 pounds of pulp) was absorbed in the case of hard sulphite pulp; this was in contrast to the 0.39% (or 3.9 pounds) of dye which was absorbed in a 4-pound dyeing using the suspension method, where the hydrochloric acid was not removed.

In the original extracted wood (corresponding to groundwood), the indications were that linkages exist between the lignin and the carbohydrates which, when split, produce groups capable of reacting with dyes. Holocellulose, which contains almost none of the lignin of the original wood (and, therefore, practically no phenolic hydroxyl groups) but does contain nearly all of the carbohydrate material (and, therefore, practically all of the carboxyl groups), absorbed more dye than the original extracted wood from which it was produced. Such linkages, to give this result, would probably be through the phenolic hydroxyl groups of the lignin and the carboxyl groups of the carbohydrate material, although these two groups are undoubtedly not linked to each other.

Upon methylation of the pulps, the amount of alum necessary to bring the acidity of the suspension of the unmethylated pulp in distilled water, dye, and rosin size to a given pH, in comparison with the same suspension of the methylated pulp was as much as 100% greater. This shows that the acidic groups covered in methylation—namely, the carboxyl and phenolic hydroxyl groups—must add substantially to the acidity of a pulp.

Incomplete methylation of sulphite, sulphate, and native lignins caused a decrease in the dye retention of sulphate and native lignin (using the suspension procedure of dyeing) but did not reduce the dye retention of sulphite lignin. Since methylation of the phenolic hydroxyl groups of sulphate and native lignin caused substantial decreases in dye sorption, but did not in the case of sulphite lignin, some other group must be responsible for the major part of the

dye sorption in sulphite lignin; the only possible one is the sulphonic acid group.

Different dyes are taken up by the same pulp in different molar relationships, as has been found by other investigators.

That different constituents of pulp form different types of compounds (or lakes) with the same dye was indicated by the resulting color of the pulps; e.g., groundwood dyed with Methylene blue had a greenish cast, whereas unbleached sulphite pulp dyed with Methylene blue had a reddish-blue cast.

Methylation of bleached pulp showed only a slight decrease in the amount of dye sorbed, although the methoxyl added was greater than in the case of the oxidized pulp, in which the amount of dye absorbed decreased considerably on methylation. This, then, indicates that the alcoholic hydroxyl groups present in the cellulose, which accounted for a greater portion of the methoxyl added, do not enter into the dyeing.

With the heaviest dyeings in commercial practice (about 10 pounds per 1000 pounds of stock), only small amounts of reactants in the pulp are necessary, since this amount of dye represents approximately 0.003 mole per 100 grams of pulp. In 100 grams of hard sulphite pulp, for example, there probably exists from 0.02 to 0.05 mole of impurities to react with the dye. The observation that the sorption of the bleached sulphite, holocellulose, and original extracted wood apparently approached a fixed value, although more methoxyl groups were still being added, may be explained by the fact that the carboxyl groups of the cellulosic materials were prevented from being methylated by metallic ions. These metallic ions, though not subject to methylation, could absorb dye by base exchange.

The dyeing mechanism can be ascribed to a chemical reaction of an acid (carboxyl, sulphonic acid, or phenolic hydroxyl groups) with a base (amine group). When the acidic groups (except the sulphonic acid groups) were methylated, the number of acidic groups was reduced; therefore, the number of groups available for chemical reaction was reduced. Further evidence of the covering of acidic groups was inferred from the increase in the amount of alum necessary to bring a dye suspension to a given pH upon methylation of the material being dyed. This mechanism can also be explained from a colloidal charge point of view. The negative colloidal charge may be ascribed to the presence of certain chemical groups (i.e., acid groups). When these acidic groups were methylated, the total negative charge was diminished and less dye was absorbed.

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TAPPI Committee Honored

In a far-reaching move, the Freight Classification Committees of the Association of American Railroads has recently appointed a Container Testing Committee that will act in an advisory capacity to advise the railroad classification committees in connection with questions regarding Rule 41, which covers corrugated and solid fiber boxes for freight shipment.

The new committee is the Container Testing Committee of the Technical Association of the Pulp and Paper Industry and is composed of Don L. Quinn, Chairman, the Don L. Quinn Company, Chicago, Ill., T. A. Carlson, Chief, Material Containers Section, U. S. Forest Products Laboratory, Madison, Wis., R. S. Millett, Acting Chief, Timber Mechanics Division, Forest Products Laboratory of Canada, Ottawa, Ont., Ralph McKee, Chief, Container Testing Section, Institute of Paper Chemistry, Appleton, Wis., and Theodore J. Gross, President, Container Testing Laboratories, New York, N. Y.

Since it has been understood for some time that the Classification Committees have been desirous of improving the quality of corrugated and solid fiber boxes over that which prevailed in wartime, through revision of Rule 41, and because this object has been clouded by war and postwar problems and by divergent views existing in the channels through which the revisions of Rule 41 normally passed by precedent, it appears obvious that the new Committee (TAPPI Container Testing Committee), composed of independent technical men should be able to screen out facts from prejudice in connection with future provisions of Rule 41 and to render a worthwhile service to the carriers, to the container industry and most of all to the shipping public. The Committee because of the experience of its members will undoubtedly meet this opportunity with great credit to itself. The Committee met on November 8th in Chicago to discuss the compression test standard.

TAPPI Notes

Ralph T. Nazzaro, formerly of the Mellon Institute, is now vice president of Agawam Chemicals, Inc., West Springfield, Mass.

Harold R. Alley, formerly of the Standard Cap & Seal Company, is now director of research for the Arvey Corporation, 3462 N. Kimball Ave., Chicago, Ill.

John P. Bainbridge has succeeded Harry Duston as official representative of the Monsanto Chemical Company in the Technical Association.

Lt. Comdr. Carl A. Von Ende, USN., has returned to S. D. Warren Co., Gardiner, Maine.

L. J. Rys, director of Harmanec Paper Mills, Ltd., Harmanec, Czecho-Slovakia, is now visiting in the United States.

Robert H. Mosher, formerly of the Monsanto Chemical Company, is now laboratory director for The Marvellum Company, Holyoke, Mass.

Etienne Perrigot, director-general of Papeteries d'Arches, Vosges, France, is visiting in the United States. This company has been making paper since 1498.

Johan Richter, chief engineer of A/B Kamyr, Oslo, Norway, is visiting in the United States.

Henry R. Adams, formerly of the Crossett Paper Mills, is now technical director of the Dunn Sulphite Paper Company, Port Huron, Mich.

Efficient Use of Fuel

The Chemical Publishing Company has made available to American readers the 807-page volume entitled "The Efficient Use of Fuel" prepared under the direction of the Education Subcommittee of the Fuel Efficiency Committee of the British Ministry of Fuel and Power.

This book was written to show British engineers how to operate their plants during the war when materials and fuels were difficult to obtain. The lessons learned during the emergency should provide the knowledge necessary for peacetime operations, especially to meet possible increases in fuels and materials cost. The volume was prepared and edited by a large and representative group of British technologists who have produced a remarkably complete and authoritative treatise on the subject.

Although the text was prepared for use in England and the composition of British fuels and the description of equipment are given without much reference to American practice, the bulk of the principles and industrial methods discussed is fully adapted to American practice.

The text is unusually complete, covering all phases of the subject. The principles of combustion and equipment used are carefully explained, for solid fuels, liquid fuels and industrial gases. Boiler efficiency and testing, water purification and auxiliary boiler equipment and boiler settings are fully discussed. The use of steam for industrial processes, central heating, drying, evaporation, etc., are described in detail. There appears to be no aspect of the economic use of fuel which has not been given good consideration.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $8.50 per copy.

Building Construction Estimating

The McGraw-Hill Book Company has recently published "Building Construction Estimating" by George H. Cooper, in charge of the Estimating Classes at the Mechanics Institute, New York, N. Y., (282 pp. 6 x 9).

This is a textbook and not a handbook and assumes only that the reader has had a high school education and an elementary knowledge of architectural drafting. The first part discusses contracting as a business, building codes, plans, specifications, contracts, and general technique of estimating.

Among the subjects covered are plans and plan reading, contracts, surveying, excavating, concrete foundations, floors and roofs, mason work, carpentry, plastering, steel and iron, roofing and sheet metal, fireproof doors and windows, painting, and the mechanical trades.

No assumption is made that the reader is familiar with any phases of the subject. There are hundreds of illustrations, showing details and specimen estimate sheets appear in all the chapters dealing with estimates. It should be of particular value to millwrights and engineers whose duties cover a wide field of construction problems and who are not specialists in any particular type of construction.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $3.00 per copy.

Niagara TAPPI Discusses Felts and Wire

The Niagara Falls Groups of the TAPPI Empire State Section met on November 13th at the General Brock Hotel, Niagara Falls, Ont. About 50 attended.

Norman O. Weil, assistant vice president of W. S. Tyler Company, discussed the manufacture of paper machine wires and causes of wire failures.

Lawrence M. Woodside of the Albany Felt Company presented a moving picture on the manufacture of woolen felts.

The December meeting will be held jointly with the Niagara Branch of the C.P.P.A. Technical Section and will be devoted to a discussion of pulp bleaching by a group of qualified speakers.

Those present included: F. H. Ayers, H. P. Bailey, H. S. Bristol, C. Brittin, D. J. Campbell, John Campbell, F. Casciani, H. S. Cutler, F. W. Decker, Mrs. Jean Drury, R. B. Embury, R. J. Farley, J. M. Gould, C. Handsbee, J. A. Hoffmeister, J. A. Horstmann, A. C. Hayes, E. E. Jones, N. C. Jones, W. Jacobs, A. E. Johnson, A. Huhnel, F. W. Loppman, Rose Martinez, H. Montague, J. C. Morrison, A. H. Nadelman, G. E. Norton, J. S. Reichert, J. Rusch, S. M. Scaletta, Mrs. Gertrude Schmidt, B. J. Staneslow, W. O. Stauffer, G. H. Storin, F. S. Tolman, C. O. Webber, N. O. Weil, M. R. Wilkins, L. M. Woodside, V. Woodside, J. W. Youngchild.

Technology of Plastics and Resins

D. Van Nostrand Company has recently issued The Technology of Plastics and Resins by J. Philip Mason of Boston University and Joseph F. Manning of the B. B. Chemical Company (493 pp. 6 x 9). This book is based upon the course in plastics and resins given at Boston University for students who have a background in general and organic chemistry. It is of interest to men in industry who wish to refresh their knowledge of the fundamentals underlying plastics development and technique.

Among the subjects covered are the following: The resinous state, the plastic state, polymerization, macromolecular structures, plastic properties and their relation to chemical structure. Under the heading of plastic types is included: rubber, cellulose, phenolics, amino aldehyde resins, cellulose derivatives, acrylic resins, polystyrene, the vinyl family, alkyd resins, protein plastics, compounding, molding, casting, laminating, coatings.

The section on laminating deals rather fully with the use of paper-plastic combinations. A large number of photographic and other illustrations are used. It is the most up to date book on the subject.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $6.50 per volume.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Roy O. Benson, Research Chemist, Dearborn Chemical Company, 1029 West 35th St., Chicago, Illinois, a 1933 graduate of the University of Illinois.

Farley M. Bowers, Beater Room Foreman, North Carolina Pulp Company, Plymouth, North Carolina. Attended Glenville State College.

Richard W. Estabrook, Assistant Superintendent, Chicopee Mfg. Corp., Ford Avenue, Milltown, New Jersey. Attended the University of Maine.

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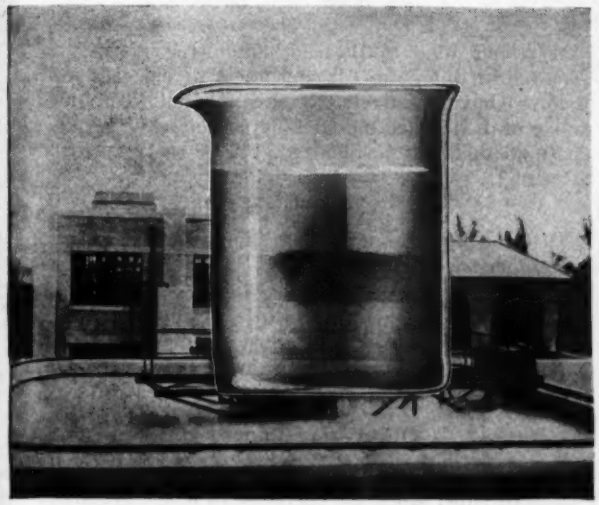

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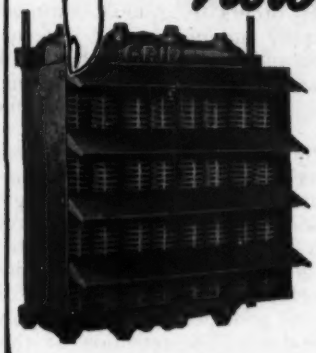

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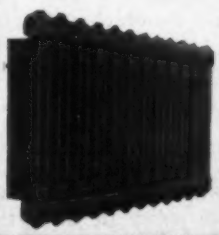

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GRID Blast Section have the same high efficiency and lasting qualities as GRID Unit Heaters —the same one piece construction "fin" sections of high test cast iron—no tortuous air passages—complete absence of ruptures, strains, and warping, and GRID Blast Sections are guaranteed for steam pressures up to 250 lbs. Complete data and capacity tables upon request.

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D. J. MURRAY MANUFACTURING CO. WAUSAU, WISCONSIN

New York Paper and Pulp Market Review

Newsprint, Magazine and Writing Paper Expected To Continue In Tight Supply — Overseas Receipts of Wood Pulp Totals 370,952 Tons — Cotton Rags Active — Mills Need More Waste Paper.

Office of the PAPER TRADE JOURNAL,
Wednesday, November 21, 1945.

Demand for paper and paper products is reported heavy during the current week. Many reports received from manufacturers' representatives, jobbers, and general paper merchants reflect difficulties in their efforts to increase inventories to insure efficient handling of customers' orders. A gradual improvement in the paper supply situation can be expected but the increasing demand for newsprint, in book paper for magazines and a tighter supply in writing, and possibly in bond papers, is expected in some quarters of the trade.

Criticism of delay by the OPA in adjusting paper and pulp prices to meet current conditions, is becoming more widely discussed. The adherance to a rigid price formula is working out in the paper industry in much the same undesirable manner as in the textile and other consumer goods lines. The result is inflationary because it forces an excessive production of higher price products and provides insufficient supply in the lower price products. The retention of this pricing policy is an economic absurdity.

The index of general business activity for the week ended November 10 rose to 124.2, from 122.8 in the preceding week, compared with 140.7 for the corresponding week in 1944. The index of paperboard production was 154.7, compared with 149.3 in the preceding week, and with 155.3 for the corresponding week in 1944.

Paper production for the week ended November 10 was estimated at 97.0%, compared with 91.3% for 1944, with 89.6% for 1943, with 89.7% for 1942, and with 107.0% for the corresponding week in 1941.

Paperboard production for the week ended November 10 was 93.0%, compared with 96.0% for 1944, with 95.0% for 1943, with 83.0% for 1942, and with 99.0% for the corresponding week in 1941.

Wood Pulp

Imports of wood pulp from overseas aggregated 9,961 tons during the week ended November 8, 1945, the Department of Commerce reported late last week. Total imports from overseas since the first post-war importations for the week ended June 29, 1945 through November 8, 1945, amounted to 370,952 tons.

This tonnage was composed of 40% unbleached sulphite, about 40% unbleached sulphate and about 9% of bleached sulphite grades, other than high alpha and dissolving pulp. The balance of 11% was groundwood, special chemical grades of bleached sulphite, and soda pulp.

Rags

The supply of new cotton cuttings is reported tighter this week, due to the short supply situation in cotton goods for the cutting up trade. This in turn is attributed to the rigid price policy of the OPA which encourages the production of high price lines and decreases the manufacture of relatively low price garments. A tight supply situation in cuttings is expected in some quarters to continue throughout this year. Prices are strong at ceiling levels.

A firmer tone in the old cotton rag market is reported at this date. All consumers of old rags are reported buying actively. Roofing felt mills continue active in the market and some report inability to purchase all the tonnage required. Prices are very firm at ceiling.

Old Rope and Bagging

Demand for old rope continues insistent for Manila, with other hard fibers steady.

No material change in the old bagging market has been reported at this date. Buying continues on a restricted scale for scrap bagging. Trading in No. 1 gunny is currently reported fair to moderate. All prices are unchanged.

Old Waste Paper

Mill demand for waste paper continues strong. All grades of paper stock are currently in heavy demand, but paperboard mills continue to require larger tonnages of folded news, mixed paper and of old corrugated. Prices are strong at ceiling levels.

Brandon Takes Fitchburg Mill

FITCHBURG, Mass., November 20, 1945—Through a consolidation of interest, Brandon Corporation, Greenville, S. C., manufacturers of cotton and asbestos dryer felts has acquired a controlling interest and assumed management of the Fitchburg Duck Mills, Fitchburg, Mass., one of the oldest manufacturers of cotton dryer felts in the country. The Morey Paper Mill Supply Co. of Fitchburg has relinquished active management of the mills so as to devote its entire time to the sales and distribution of all the dryer felts manufactured by both the northern and southern plants. At the same time, the Woodward, Baldwin & Co. of Baltimore were named General Agents for the Fitchburg Duck Mills and will serve in the same capacity for both mills. Both mills will maintain their corporate identity and will continue the manufacture of their wide range of cotton felts, and asbestos felts.

Boston Merchants Move

BOSTON, Mass., November 19, 1945—Hurlbert & Hatfield, general paper merchants, will remove, as of December 1, from 596 Atlantic avenue to 610 Atlantic avenue, where they will occupy the entire third floor. Smith & Lane Company, who are on that floor at 610 Atlantic avenue, will remove as of the same date to 665 Atlantic avenue, Room 431. They are direct mill representatives, handling paper and wood products, transparent containers and specialty plain and printed bags. They have been at this location twelve years.

W. C. Dodge Paper Company, general paper merchants, on the same floor at 610 Atlantic avenue, will remove as of December 1 to occupy the quarters to be vacated by Hurlbert & Hatfield.

ELOF HANSSON, INC.

Machinery Department

Exporters of all types of paper and pulp mill machinery and supplies. Offices and agents in all world markets. Additional accounts invited.

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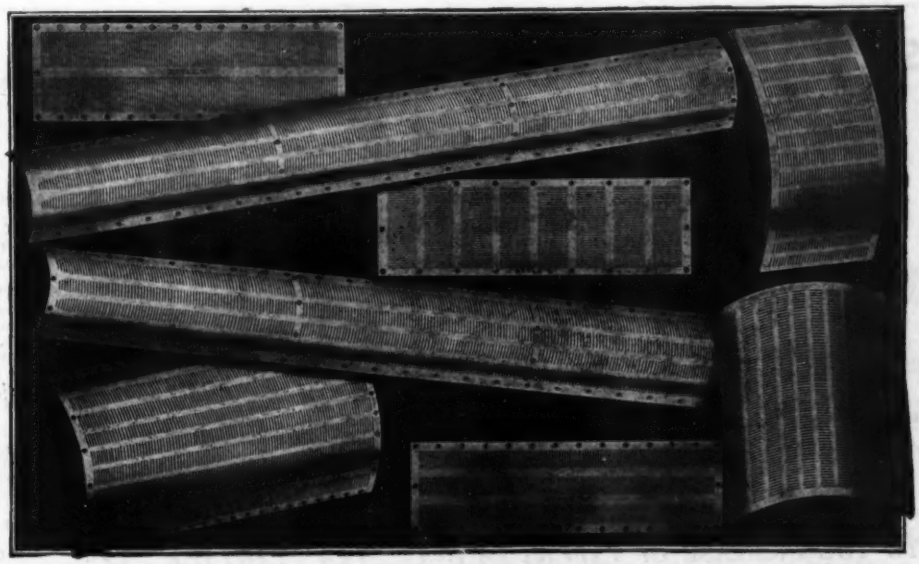

"HARDY" BRONZE and CHROME-NICKEL-STEEL SCREEN PLATES.

MAGNUS METAL CORP. FITCHBURG, MASS.

HOW OAKITE CLEANING HELPS MILLS ECONOMIZE ON MAINTENANCE!

Avoid Costly Drilling When Cleaning Suction Press Rolls

Suction press roll cleaning in the past usually involved the drilling-out of each individual clogged hole. Now, a highly specialized, modern Oakite method, tailored to fit your particular conditions, eliminates this tedious, time-consuming necessity.

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SUPERCALENDERED BOOK and LITHOGRAPHIC PAPERS

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KRAFT LINER BOARD
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ESTABLISHED OVER A QUARTER OF A CENTURY

EXPORT ONLY

PAPER, PAPER PRODUCTS AND ALLIED LINES

OPERATING IN 30 FOREIGN MARKETS

HIGHLY TRAINED SALES FORCE

ALL PAYMENTS ACCORDING TO YOUR TERMS IN NEW YORK.

DUE TO THE INCREASE OF EXPORT OUTLETS WE SEEK ADDITIONAL SOURCES OF SUPPLY

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FOR your post-war converting machinery requirements early planning will help you. Now is the time to place your orders for your anticipated converting machineyr requirements.

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PRINTING PRESSES
Rotary, Oil Ink, Aniline Multi-color, Arc-type, In Series, Bag and Notion Envelope.

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Towel, Tissue, Napkin, Wax, Facial Tissue, Table Covers.

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1. Glassine. 2. Board. 3. Towel. 4. Tissue. 5. Napkin. 6 Wrapping. 7. Special Purpose.

WINDERS
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Tissue, Kraft, Waterproof

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Adjustable, Napkin, Multi-Wall Bag.

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Toilet Roll Wrappers, Vacuum Pumps, Seat Cover Machines, Die Inkers, Core Machines, Core Recutters.

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Manufacturers of paper converting machinery for all purposes

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Machines must help the situation in man-power! Uninterrupted protection of equipment from misalignment, shock, and vibration in speed-up, means more than ever. L-R Resilient Alignment Couplings insure this protection. Free-floating cushions of material best adapted to pulp and paper mill duties, are suspended between rugged jaws. Cushions free to adjust to every emergency. Always in sight for inspection. *No* shut-downs for changing. Never require lubrication.

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Charts lead you right to couplings you want without tedious figuring. For all duties from 1/8 to 2500 h.p. Wire or write

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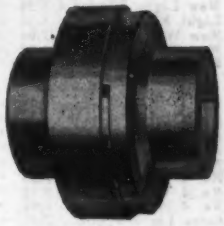

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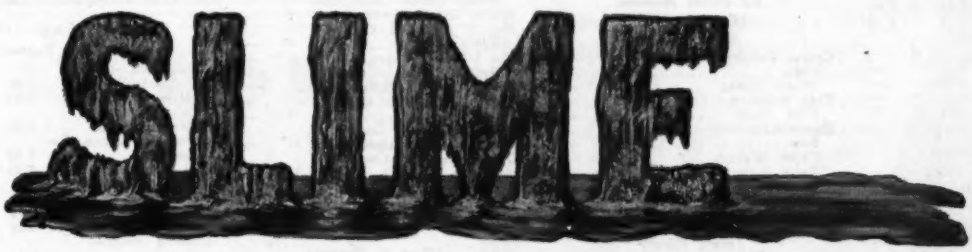


...AND HOW TO CONTROL IT

Those machines of yours can't roll faster when slime gets the upper hand.

With Magnus Slime Remover, you can keep slime under definite and dependable control. It quickly penetrates, loosens and removes slime deposits. It kills the active bacteria present—and even more important, it kills the fungi which are the real basis of most mill slimes. Thus it not only removes existing slime growths, but materially slows down the rate of new slime formation.

Used at the rate of about 10 pounds per 1000 gallons of water in the beater, Magnus Slime Remover is successively circulated to the main stock chest, the distributing box, and the wet end of the machine, removing most of the slime in the process, and loosening the balance so that it is readily removed by hosing down after the cleaning solution has been run out.

Let us know if you are interested in a thorough test of Magnus Slime Remover on a 30-day trial basis.

MAGNUS CHEMICAL CO., 24 SOUTH AVE., GARWOOD, N. J.

MAGNUS Paper Mill Cleaners

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations

All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¼
Light Silesias	.05¼
Black Silesias, soft	.03½
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean bright—			
Sisal Strings	.04	"	—
No. 2 Clean bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	Nominal		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	Nominal		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	Nominal		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	Nominal		
Domestic	3.00	"	3.25
South American	—	"	3.25
Wool Tares—			
Foreign	Nominal		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.40
New Zealand Wool Pouches	—	"	3.30
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	2.60
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04½
Fancy Percales	.04½	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¾	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06½
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached Blue Cheviots	.06¾	"	.06¾
Fancy	.05½	"	.06
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03¾	"	.03½
Corduroy	.03¾	"	.03½
New Canvas	.06½	"	.06½
B. V. D. Cuttings	.06¾	"	.07

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.30	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

Holyoke Wires

for

Better Service

Manfg. by

Holyoke Wire Cloth Co.
Holyoke, Mass.

COLORS

for

Board* and *Paper

Green

CHROMIUM OXIDES

Black Brown Red Yellow

IRON OXIDES

LAMP BLACK

TALC

UMBERS

VENETIAN REDS

YELLOW OCHRES

C. K. WILLIAMS & CO.
Easton, Pa.

Felts are like Milady's silk hose. One undetected flaw in manufacture, one miscue while installing and starting up a felt or during wash-ups, inflicts irreparable damage.

That's why machine crews should be so thoroughly coached on the handling of felts that mishaps do not occur.

ORR Felts are available in all required textures for machines of all sizes, running on all grades.

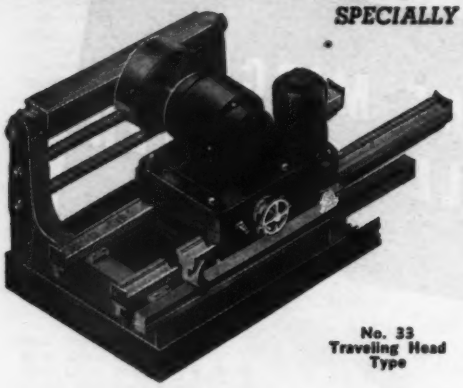
Consult the ORR representative in your area.

THE ORR FELT & BLANKET CO.
PIQUA, OHIO

Orr Felts

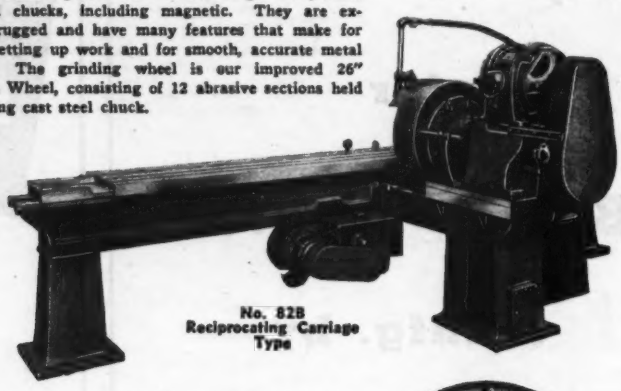
TWO NEW "Bridgeport" GRINDERS FOR PAPER MILLS

SPECIALLY DESIGNED FOR RAPID, ACCURATE GRINDING OF PAPER, CHIPPER, RAG AND VENEER KNIVES



No. 33
Traveling Head
Type

These grinders operate with various angle bars, knife bars and chucks, including magnetic. They are extremely rugged and have many features that make for ease of setting up work and for smooth, accurate metal removal. The grinding wheel is our improved 26" Sectional Wheel, consisting of 12 abrasive sections held in a strong cast steel chuck.



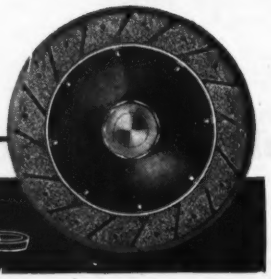
No. 82B
Reciprocating Carriage
Type

For production grinding, or merely for truing up, either of these machines is a satisfying addition to any sizable paper mill. Details on request.

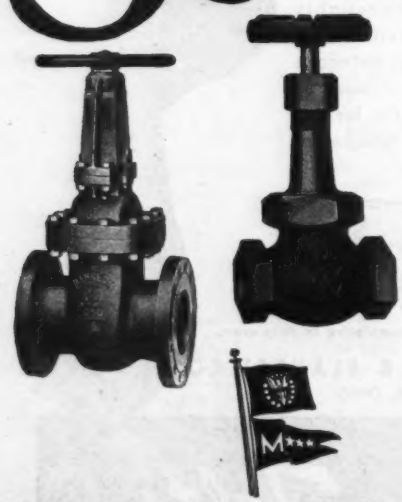
The Bridgeport Safety Emery Wheel Co., Inc. • Bridgeport, Conn., U. S. A.

Bridgeport

GRINDERS • GRINDING WHEELS • BUFFING LATHES



Sturdy *in every part*



THICK body walls, heavy flanges, large bolts, and deep stuffing boxes are characteristic of every Kennedy Valve type. Operating mechanisms are simple, strong and positive in operation, stems are of specially tough metal, and handwheels are amply large for easy leverage.

Whether you require valves for low, medium, extra heavy or hydraulic pressures, you will find an exactly suitable Kennedy Valve type which has proven its reliability in many thousands of installations in the paper industry.

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Extra Values in VALVES and PIPE FITTINGS

"LOOK AT THAT PAPER TYCOON SMILEY ... TAKING ON THE CHAMP HIMSELF"

"YEAH, EVER SINCE HE SIGNED UP HUBBS HOUSES TO SELL HIS LINE HE'S BEEN LUCKY AS A FOX"

Mr. Mill Executive.... and Mr. Converter .... you may never go so far as to "take on" a boxing champion .... but we think you will feel mighty good about your HUBBS HOUSES selling connection soon after putting us to work.

The trained HUBBS HOUSES sales staff reaches the important buyers in America's No. 1 Market.... from Indiana east.....and can give you good distribution quickly at reasonable cost.

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GARDEN CITY PAPER MILLS CO., LTD.
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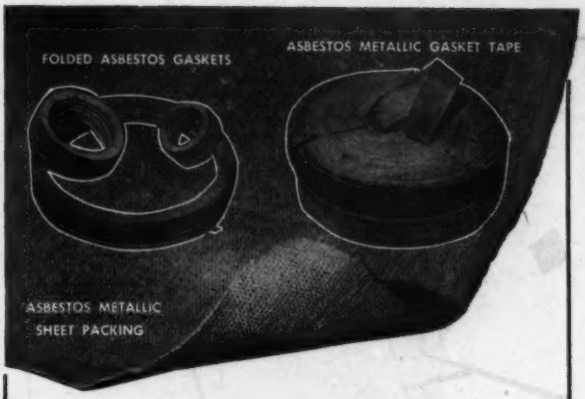
CANADIAN VEGETABLE PARCHMENT CO., LTD.
MERRITTON, ONT.

WAREHOUSES AT ALL THE ABOVE.



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PALMETTO FOLDED ASBESTOS GASKETS

For boiler handhole and manhole service. Exceptionally resilient and compressible. Two important features for better service . . . each gasket is carefully hand blocked to accurate size; and the seam on each gasket is on the outside, away from the pressure.

PALMETTO ASBESTOS METALLIC SHEET PACKING

Extra strong . . . extra heat-resistant . . . extra durable. The sheet packing for best service on engine cylinder heads and other purposes where a wire-inserted woven cloth gasket or sheet is required.

PALMETTO ASBESTOS METALLIC GASKET TAPE

Highest quality folded tape . . . coated with heat-resisting compound . . . adapted for gaskets and gasket strips of any shape and length.

IMMEDIATE SHIPMENT

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NO PRIORITIES REQUIRED

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Four of a kind
are hard to beat

Starches, Gums, Syrup and Dextrines made by CORN PRODUCTS solve many manufacturing problems. CORN PRODUCTS technical staff is at your service to assist you in making efficient, economical use of these fine products.

AMIJEL
(for the beaters)

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(for laminating)

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(for corrugating)

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(for enzyme conversion)

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Corn Products Sales Co.
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GOOD COMPANY

You'll be in "good company" when you locate your plant in Seaboard territory. The record of success enjoyed by operators in this section constitutes an unqualified testimonial to the numerous advantages that are indigenous to this area.

If you want to put your plant where conditions are most favorable, get the benefit of our detailed knowledge—knowledge acquired through years of experience in locating industrial plants.

Our staff of trained specialists will supply you quickly with complete information on sites that are suited to *your* needs.

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General Industrial Agent
Seaboard Air Line Railway
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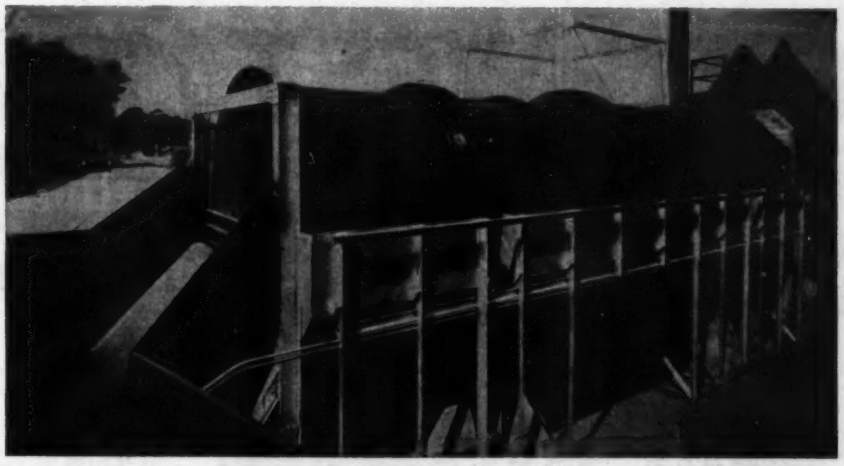
AIR LINE RAILWAY
THROUGH THE HEART OF THE SOUTH

Buy Victory Bonds!



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CARTHAGE MACHINE COMPANY

Engineers and Builders of

PULP AND PAPER MILL MACHINERY

Shredders - Grinders - Barkers - Chippers - Pumps - Wet Machines - Chip Screens and Crushers - Wood Washers - Valves - Agitators - Sulphite Mill Machinery - Lead and Bronze Work Specialty

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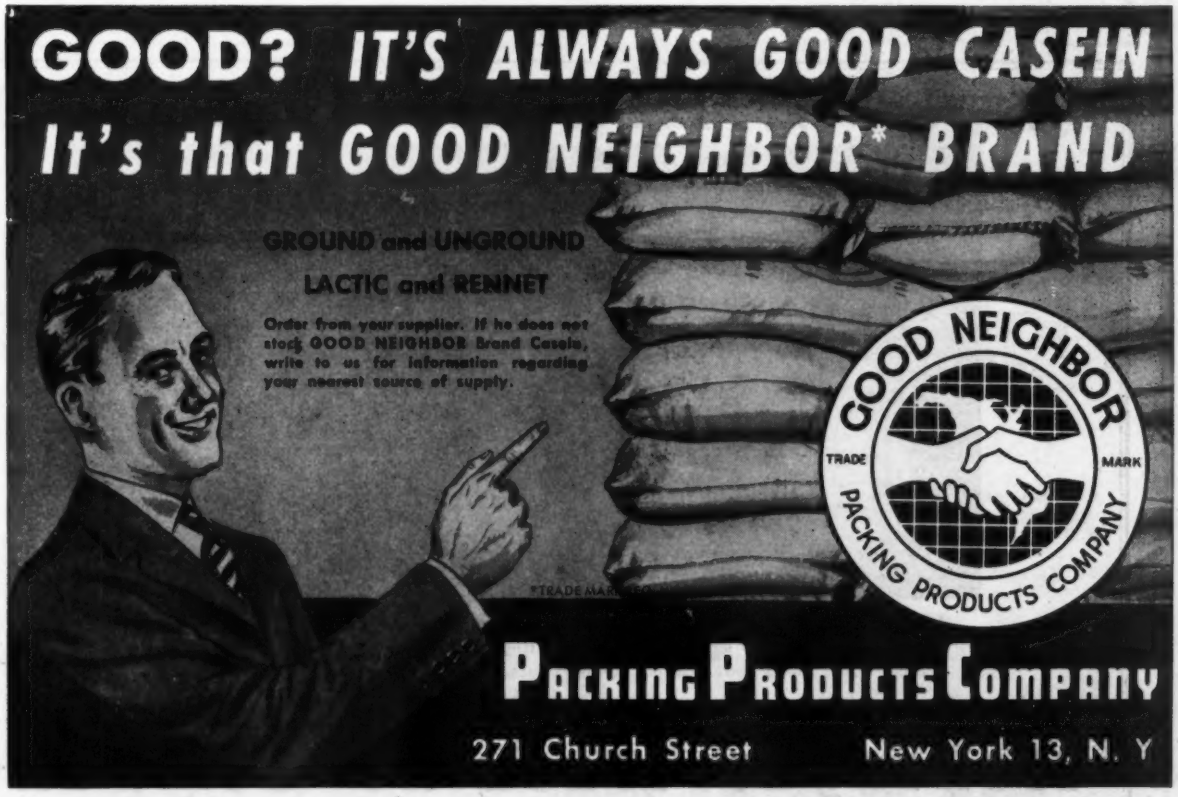
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It's that GOOD NEIGHBOR* BRAND
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Order from your supplier. If he does not stock GOOD NEIGHBOR Brand Casein, write to us for information regarding your nearest source of supply.
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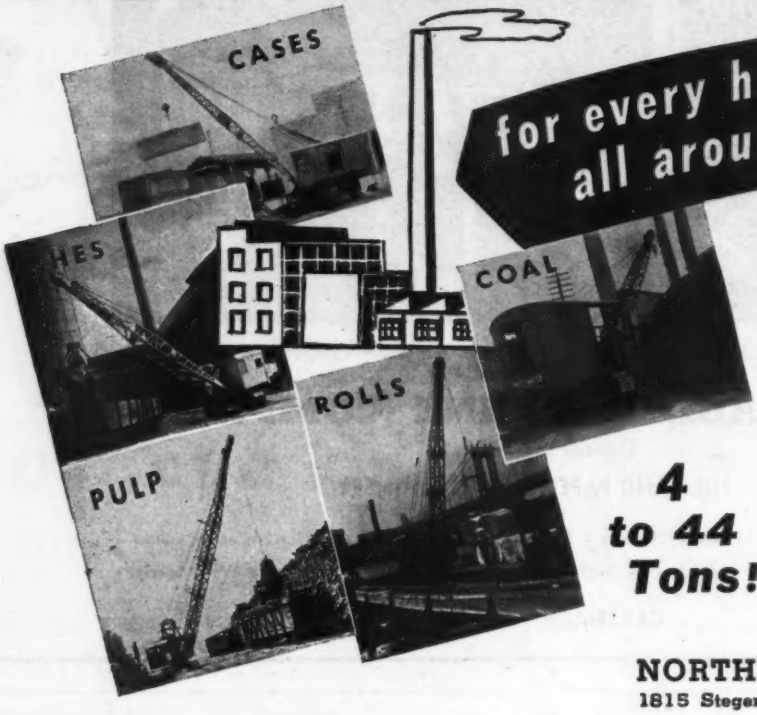


for every handling problem all around the mill!

4 to 44 Tons!

Your crawler crane is the most versatile yard tool in existence. It goes anywhere and handles anything within its rated capacity.

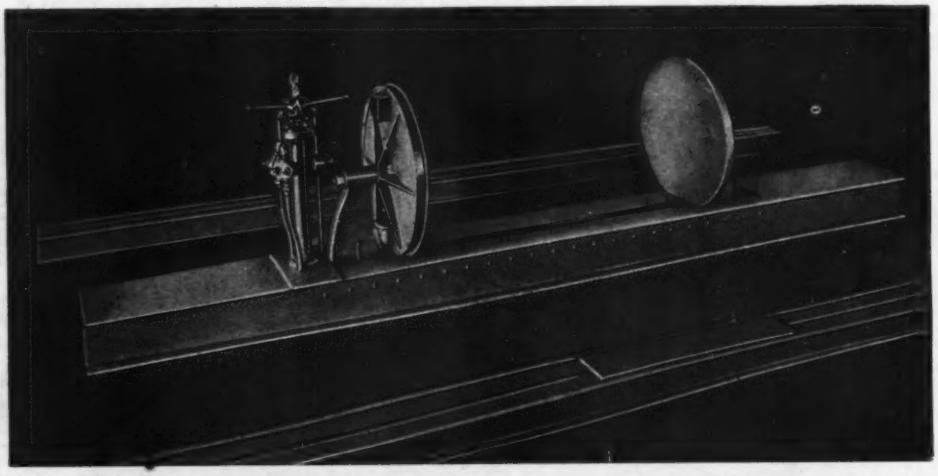
Your crawler crane is the only type of equipment you can route from job to job and keep busy all day long at any point in the plant. It will handle coal and ashes, bulk dry chemicals, pulpwood finished paper in cases or rolls.

It fits into the problems of any size mill, permits additions to your plant without regard to present handling systems and makes available for storage those odd corners that with other handling equipment are normally regarded as waste space.

There is a size for every problem—4 to 44 tons. Let us send you details on the size that interests you.

NORTHWEST ENGINEERING CO.
1815 Steger Bldg., 28 E. Jackson Blvd., Chicago 4, Ill.

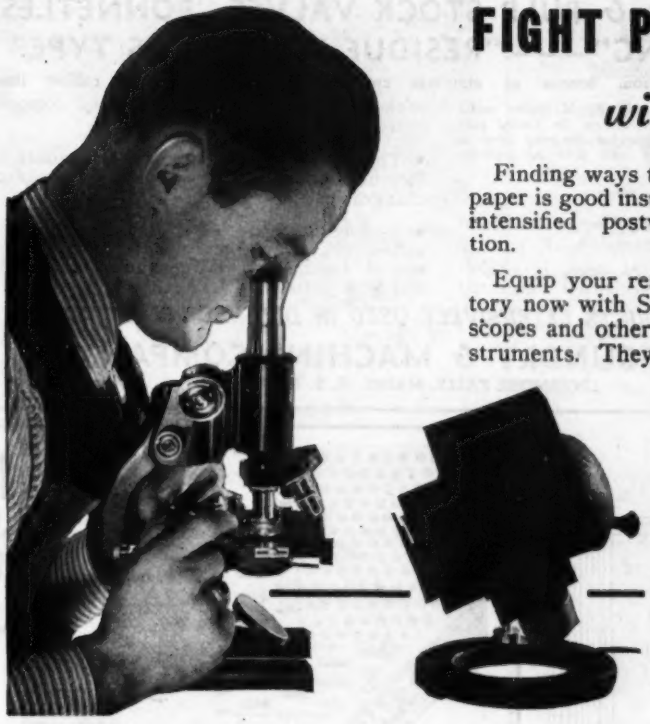
W. & W. HEADING MACHINE



Furnished complete ready for installation. Operated by compressed air. Heads heated by steam or electricity. Built to suit different diameters and lengths of rolls. When installed only heads and supporting stands appear above floor line. Transfer trackage and shuttle cars furnished also.

Built in association with Williams & Wilson Limited, Montreal

Montague Machine Company
Turners Falls, Mass.



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Finding ways to make better paper is good insurance against intensified postwar competition.

Equip your research laboratory now with Spencer Microscopes and other Scientific Instruments. They are valuable in paper technology for . . . **analyzing specks . . . studying surface characteristics . . . identifying fibers . . . determining particle size of fillers and other material . . . studying beating characteristics of pulp . . .** and many other applications.

To meet the varied needs of paper technologists, a wide range of equipment is available:

- **Microscopes: Laboratory, Polarizing, Stereoscopic**
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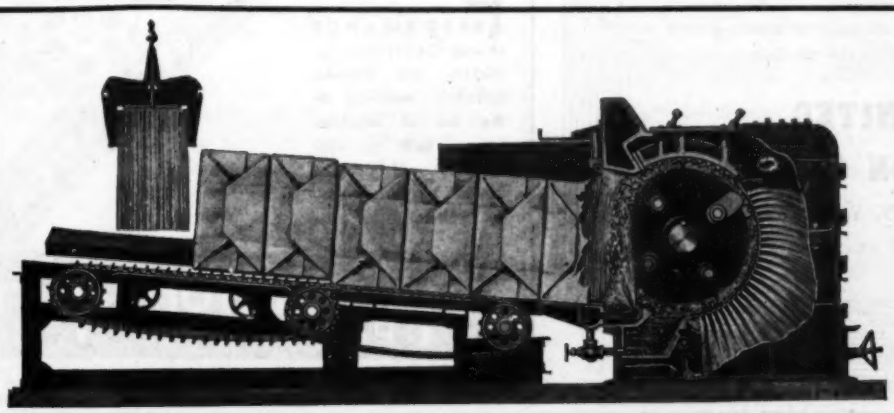


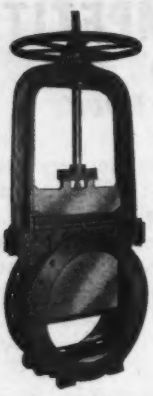
Improved
Bale Pulper
TRADE NAME

PROTECTED BY U. S. PAT. 1,910,382 AND FOREIGN PATENTS. OTHER PATENTS PENDING.

STURTEVANT BALE PULPER
for
PULPING
Bales — Rolls — Laps

Discharging at Consistencies for Pumping or Trucking any Desired Tonnage

STURTEVANT MILL CO. HARRISON SQUARE **BOSTON 22, MASS.**



RECORD PAPER & PULP STOCK VALVES "BONNETLESS SELF CLEARING" – – – "RESIDUE POCKETLESS TYPE"

METALS — I.B.B.M., all iron, bronze or stainless steels, body parts plain or rubber lined.

The photo of 24" Fig. 241 I. B. B. M. valve while illustrating the gate bottom wedge system for forced gate seating and "GUILLOTINE" edge for shearing fibre at seat also shows the packing box and yoke as separate units. Both adjustable.

- The "FAST THREADED" screw stem and ball bearing speeds valve operation.
- The packing box is extra deep, is adjustable and provided with specialized lubricated packings and special type gland and compression bolts.
- The yoke mountings are such that yokes for various methods of gate operation are interchangeable.
- Replaceable gate edge shoes are used in valves 10" and larger. These shoes are of special value when valves are installed stem and pipe horizontal.

"RECORD PRODUCTS EXTENSIVELY USED IN DEFENSE PROJECTS."

RECORD FOUNDRY & MACHINE COMPANY

LIVERMORE FALLS, MAINE, U. S. A.

UNITED BLACKS

KOSMOS • DIXIE

PARIS BLACKS

Carbon blacks for all paper and board stocks—outstanding soft texture, particle fineness and jet black color. Takes well to the fiber, shows high retention.

Best for performance in the Beater and Jordan because of ease of wetting and ready dispersion in the furnish.

UNITED CARBON CO., INC.

CHARLESTON, WEST VIRGINIA

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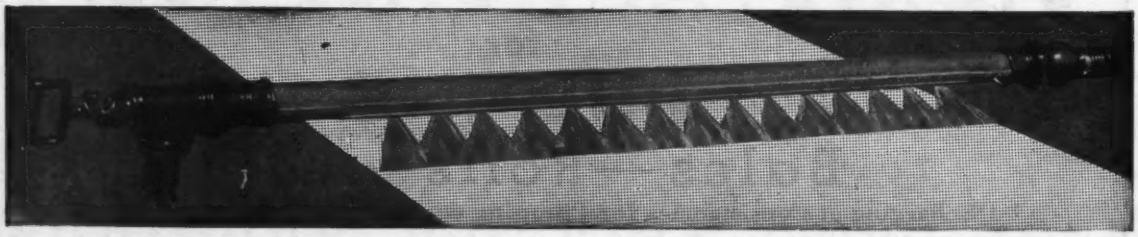
SCREENS for PAPER and PULP MILLS

PERFORMANCE of your Centrifugals, Shakers and Drainers definitely improved by the use of precision screens built to your specifications. Let us "sit in" on your screening problems.

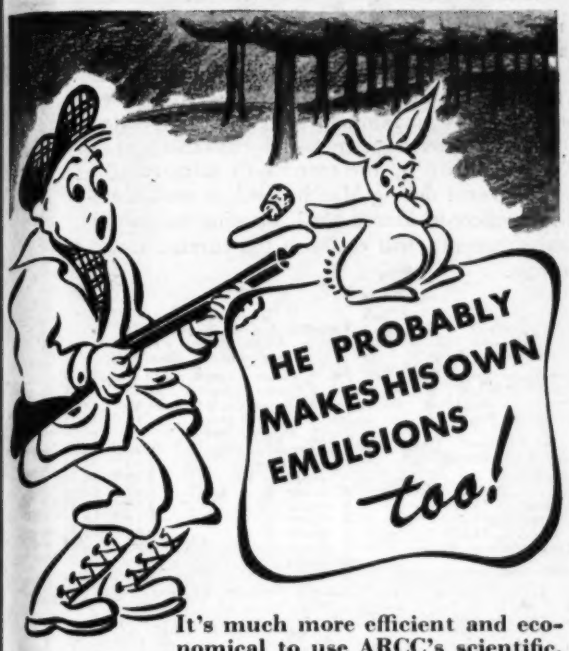
The Harrington & King PERFORATING Co.

5652 Fillmore St., Chicago 44, Ill.—114 Liberty St., New York 6, N. Y.

For SHOWER PIPES—*Call Headquarters!!*



Bulletin 134 **SANDUSKY FOUNDRY & MACHINE CO.** Sandusky, Ohio



It's much more efficient and economical to use ARCC's scientific, quantitative emulsion facilities than to mix your own.

THE *Why* OF RESIN EMULSIONS IN PAPER PROCESSING AND FINISHING

Compounding possibilities are myriad; this flexibility in economical custom composition assures precisely the wanted results in paper processing.

Applications are myriad, too; startling characteristics of tear and wet strength, grease, water and age resistance — adhesion, heat seal, electrical insulation — may be attained with resin emulsions.

Specifically ARCC EMULSIONS

Distinguished by stability, uniformity, availability and low cost.

Arrangements for assistance from your nearest ARCC laboratory will be made promptly upon receipt of your request. No obligation, of course.

Division of Paper Trade Chemicals.

American Resinous Chemicals Corp.

HOME OFFICES AND LABORATORIES: PEABODY, MASS.
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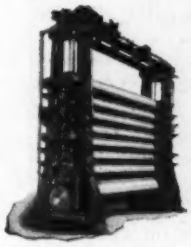
IF YOUR COSTS ARE OUT OF LINE

Modernization might be the solution

To get the most out of manpower—to utilize materials to the best advantage—it may be necessary to streamline your production set-up, by the installation of more efficient machinery.

Replace those worn out machines . . . turn out *more* production with the *same* men and materials, at *lower* unit cost. Lobdell quality machinery for the paper and allied industries has helped many mills solve their cost and production problems . . . it may be the answer to yours.

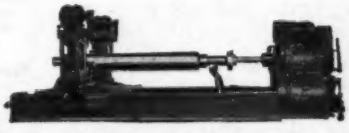


Calender Stacks

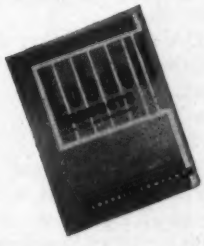
LOBDELL MACHINERY: Calender Stacks . . . accurate, durable and easy to operate. Low maintenance costs. Chosen unanimously by many leading paper mills.

Roll Grinder . . . Takes the "guess work" out of roll grinding; grinds and feeds *automatically*. Grinds rolls accurately in your own plant without tying up calender stacks unnecessarily.

"Puraloy" Calender Rolls . . . 10 to 15 percent harder than ordinary chilled iron rolls. Made in different alloys for use with dyes and chemicals in paper, rubber, paint, oil and other industries. Roll Calipers . . . For keeping accurate check on rolls before and after grinding.



Roll Grinder



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Grinders Stacks Rolls
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SIGN and MAIL... today

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COMPANY ESTAB. 1836 WILMINGTON 99, DEL.

Built and sustained upon the rights to FREE COMPETITIVE PRIVATE ENTERPRISE guaranteed by the Constitution of the United States

New Improved Roll Grinding Machines • Rolls • Calender Stacks • Roll Calipers

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, November 21, 1945

BLANC FIXE—Prices on blanc fixe continue unchanged at prevailing levels. Demand is reported fair. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER — All-over demand continues heavy. Production reported high. Backlog orders still very large. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24½ cents per pound, less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point. Imported 24 to 24¾ cents.

CAUSTIC SODA—Demand very heavy. Production large, but under demand. Market tight. Shipments still delayed by lack of manpower. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported moderate on many grades of china clay. Quotations unchanged Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—All essential requirements heavy. Production reported improving. Supply situation currently improved. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—No offerings or sales. The OPA price on "G" gum rosin is $6.74 per 100 pounds in barrels, at Savannah. "FF" rosin is established quoted at $6.70 per 100 pounds, in barrels at New York. Average price on seventy per cent gum rosin size is $6.95 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand for soda ash is reported to absorb current production. Market still is tight. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market is reported steady. Receipts higher this week but under last year. Demand heavy. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand good. Supply situation is favorable. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.75 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR — Current consumption of sulphur continues heavy. Market situation unchanged. The quotation on annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported good. Domestic grades are currently quoted at from $16 to $21 per ton at mines. Canadian at $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$61.00	@	—
Sheets	69.00	@	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Supermandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
Boards, per ton—			
News	*50.00	@	—
Chip	*50.00	"	—
Sgl. Mla. Ll. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	32.20 "	37.75	33.35 "	39.25
85% Rag	.... "	....	29.90 "	35.00
75% Rag	23.00 "	27.00	24.15 "	28.25
65% Rag	.... "	....	22.80 "	27.75
50% Rag	18.70 "	22.75	19.90 "	24.25
25% Rag	16.40 "	20.00	17.55 "	21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$10.55	@ $12.75	$11.70	@ $14.25
No. 2	9.65 "	11.75	10.80 "	13.25
No. 3	9.20 "	11.25	10.35 "	12.50
No. 4	8.90 "	10.75	10.05 "	12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cases Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$13.30
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.30
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00 @ 82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50% 80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	13.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	3.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

*OPA Maximum Prices

PARIS 2

The **BLACK** *for* **PAPER**

• A COLUMBIAN COLLOID •

Especially created to overcome dispersion problems, Paris 2 is the easiest wetting black in the paper field.

- ✔ Free from oiliness
- ✔ Optimum particle size
- ✔ High tinting strength
- ✔ Uniformity
- ✔ Ease of dispersion

Use

PARIS 2 BLACK

for

JET BLACK PAPERS

or

GRAY-TINTED STOCKS

Technical Inquiry Is Invited

COLUMBIAN CARBON CO. • BINNEY & SMITH CO.

MANUFACTURER DISTRIBUTOR

41 EAST 42nd STREET • NEW YORK 17, N. Y.

Carries Nearly Full Load

EVEN WHEN DAMP!

TANNATE flat leather belts keep machines running at peak efficiency, without trouble, with very little maintenance. They carry practically full load, even when damp . . . are cemented with waterproof cement and treated to resist moisture.

Says one user: "Our Tannate belts have needed shortening only once in 16 years . . . operating in dampness and temperatures up to 105° the year around." Crediting a Tannate belt on a wood chipper, another user reports 1/3 increase in output, longer life, and substantially lower chipping cost!

Take the hint!* . . . For increased output and reduced cost, *try Tannate!

STEP UP PRODUCTION with

RHOADS *Tannate* **WATERSHED LEATHER BELTING**

—Established 1702—

J. E. RHOADS & SONS

35 N. SIXTH ST., PHILADELPHIA, PA.

NEW YORK • CHICAGO • ATLANTA

MARATHON SPIRAL PAPER TUBE CORE WINDING

Machine manufactured to number
of layers and specifications.

DIESEL CYLINDER HEADS
MANIFOLDS
PRODUCTION MACHINING

MARATHON FOUNDRY & MACHINE COMPANY
Wausau, Wisconsin

Chemicals
FOR PULP & PAPER

CHLORINE
CAUSTIC SODA
OTHER STAUFFER PRODUCTS
*Aluminum Sulphate
Borax
Boric Acid
Carbon Bisulphide
Carbon Tetrachloride
Citric Acid
*Copperas
Cream of Tartar
Muriatic Acid
Nitric Acid
Silicon Tetrachloride
Sodium Hydrosulphide
Stripper, Textile
Sulphur
Sulphuric Acid
Sulphur Chloride
*Superphosphate
Tartar Emetic
Tartaric Acid
Titanium Tetrachloride
(*Items marked with star are sold on West Coast only.)

STAUFFER CHEMICAL CO.
NIAGARA DIVISION
420 Lexington Avenue, New York 17, N. Y. — 555 South Flower St., Los Angeles 13, Cal.
221 North LaSalle Street, Chicago 1, Illinois — 626 California Street, San Francisco 8, Cal.
474 Ohio Bldg., Akron 8, O. — Orlando, Fla. — North Portland, Oregon — Houston 2, Texas

ROGERS "NT"

The KNIFE GRINDER
Known for its
EXTRA WIDE "V" WAYS

Nearly 5" wide . . . the "V" WAYS on this big, rugged Rogers Grinder are wider than on other grinders. The result is *outstanding precision* grinding 24 hours a day if necessary. Positive accuracy assured . . . at lowest maintenance. Send for Circular "NT" and reasonable prices.

SAMUEL C. ROGERS & CO.
202 Dutton Ave.
Buffalo 11, N. Y.

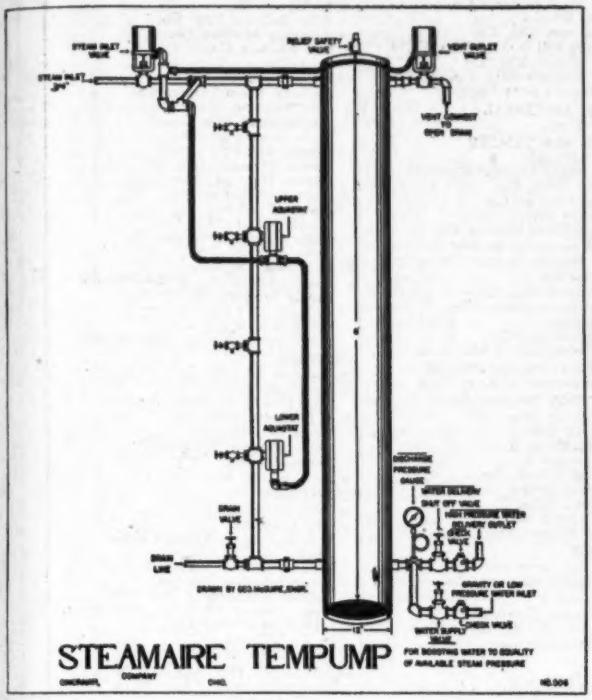
ROGERS KNIFE GRINDERS
PRECISION QUALITY SINCE 1887

EXCELSIOR
Woolen Co.
Camden, Me.
FELTS & JACKETS

"EXCELSIOR" FELTS

Manufacturers of Felts of Superior Quality
for Every Grade of Pulp and Paper

KNOX WOOLEN COMPANY
CAMDEN, MAINE



The only water pump with NO moving parts, NO motor, NO packing, NO wear. Complete automatic feed and discharge operated by 110 volt electric controls.

Wherever high pressure water is required, and equally high pressure steam is available, the TEMPUMP will deliver any quantity of water at the required pressure — constantly. Will handle any liquid hot or cold.

For filling roof storage tanks; cooling towers; boiler water feed systems; sprinkler systems, etc.

STEAMAIRE COMPANY

HOME OFFICE AND FACTORY

CINCINNATI, OHIO

ESTIMATING AND SERVICE

Boston, Mass — Charlotte, N. C. — Atlanta, Ga. — Chicago, Ill. — New York, N. Y. — Providence, R. I. — Greenville S. C. — Toronto, Canada — Bombay, India

save

manhours
production time
maintenance cost

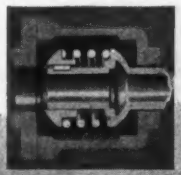
with JOHNSON ROTARY PRESSURE JOINTS

● Operating men everywhere have learned that the Johnson Joint is far more than just a better stuffing box or steam fit. It's an effective way to help solve many of your operating problems, this year and every year.

To begin with, the Johnson Joint steps up production. Its simple trouble-free design saves valuable time that is wasted when machines are shut down to repack or repair stuffing boxes. In addition, it provides a simple, neater way to install more efficient methods of syphon drainage.

While production goes up, maintenance costs come down. The Johnson Joint has no packing to wear out, needs no oiling or adjusting, and absorbs trouble-causing misalignment—both lateral and angular.

Reducing maintenance of course stretches your manpower—makes hard-to-get help available for more productive work. This is particularly important today. From every standpoint, you never had greater need for the Johnson Joint than you have *right now.*

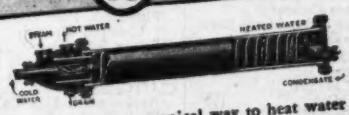


Write for full information

The Johnson Corporation

828 Wood Street . Three Rivers, Mich.

NEED HOT WATER?



The simplest, quickest, most economical way to heat water with steam is with the Johnson Instant Heater. Needs no reducers; hooks right up to high pressure steam lines. Available now in lower cost, all steel construction, or for use in process work with heating chamber of copper tubes.

Complete range of sizes, capacities; write for bulletin

WHERE TO BUY

ABRASIVES
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Monsanto Chemical Co.
Norton Co.

ADHESIVES
American Resinous Chemicals Corp.
Arabol Mfg. Co.
Glidden Company, Soya Products Div.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

AGITATORS
Appleton Machine Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

AIR CONDITIONING
Steamaire Company

BAG MACHINES
Thomas W. Hall Co., Inc.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co.
Montague Machine Works
Rollway Bearing Co.
Shartle Brothers Machine Co.
SKF Industries Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downington Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
Graton & Knight Company
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

BLEACHING APPARATUS
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Shady Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

BUILDERS—PAPER MILLS
Merritt-Chapman & Scott Co.

CALENDERS
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdel Car Wheel Co.
Moore & White Co.
Black-Clawson Company
Perkins & Son, Inc., B. F.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASEIN
Packing Products Co.

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Fort Pitt Steel Casting Co., Div. H. K. Porter Company, Inc.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross, J. O. Eng. Co.
Shartle Brothers Machine Co.

CHEMICALS
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali Co.
Dispersion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Glidden Corp.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemical Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Oakite Products, Inc.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnet Mfg. Co.
Stearns Magnetic Mfg. Co.
T. B. Wood's Sons Company

COATING MATERIAL
Glidden Corp.

COATING MACHINERY
Horton Mfg. Co.
Hudson Sharp Machine Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSTRUCTION ENGINEERS
Merritt-Chapman & Scott Corp.

CONSULTING ENGINEERS
W. H. L. D. Beta
Frederic C. Clark
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierck, Inc.
The Kohler System Company
Main, Inc., Chas. T.
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONTROLS
The Bristol Company
Stickle Steam Specialties Co.

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elixman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Piehn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
Noble & Wood Machine C.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

CRANES
Northwest Engrg. Co.

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGESTERS
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers
United States Rubber Co.
Westinghouse Electric Corporation

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric Corporation

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EQUIPMENT INSTALLATION
Merritt-Chapman & Scott Corp.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Builders-Providence, Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Suply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
W. H. Loomis Talc Corp.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pumo & Machy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

GEARS
Black-Clawson Company

WHERE TO BUY

De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Norton Company
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Fibre Making Processes, Inc.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Worthing Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

HUMIDITY CONTROL
Steamaire Company

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
N. P. Bowsher
The Bristol Company
Builders-Providence, Inc.
The Foxboro Company
General Electric
W. & L. B. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Testing Machines Inc.
Wallace & Tiernan Instrument Co.

JORDAN FILLINGS
Appleton Machine Co.
Behr Brothers Mfg. Co.
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Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
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Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

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Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
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Taber Instrument Co.
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LUBRICATORS
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MATERIAL HANDLING
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Montague Machine Co.
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De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

PACKING BOXES
Johnson Corporation
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PACKING
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United States Rubber Co.

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Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

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E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
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Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

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Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

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Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Stowe-Woodward Inc.
Taylor Forge & Pipe Works
Walworth Company
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PLATES
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Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
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The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

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Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
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Smith & Winchester Mfg. Co.
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Worthington Pump & Machinery Corp.

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Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp, J. O.
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De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
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Shartle Brothers Machine Co.
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Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
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Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
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Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

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Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
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American Resinous Chemicals Corp.
Glidden Corp.
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Farrel-Birmingham Co.
Improved Paper Machy. Corp.
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Perkins, B. F., & Sons Co.
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The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
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United States Ruber Co.
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Waldron Corp., John

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Youngstown Welding & Engrg. Co.

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Johnstone Eng. & Machine Co.
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Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

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Fitchburg Screen Plate Co.
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Appleton Machine Company
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Carthage Machine Co.
Dilts Machine Works, Inc.
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Harrington & King Perforating Co.
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D. J. Murray Mfg. Co.
J. J. Ross Company
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Shartle Brothers Machine Co.
Valley Iron Works Co.

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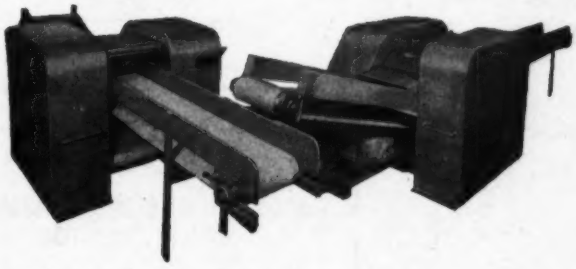

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Types of Felts Used:
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WANTED

WANTED

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WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

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Adaptable also for brushing out fibre bundles and lumps with minimum degree of cutting and reduction of Freeness. (Tissues).

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SALES ENGINEER—Age 25-35. Preferably Training pulp and paper industry. Willing travel. Good opportunity—reliable firm. Address Box 45-763 care Paper Trade Journal. N-29

WANTED—Assistant Superintendent for New England Wall Paper Factory. State experience in paper coating and surface printing. Give full information in letter. Address Box 45-731 care Paper Trade Journal. N-22

WANTED — EXPERIENCED WELL-TRAINED TECHNICAL MAN TO SUPERVISE RESEARCH AND DEVELOPMENT WORK IN SULPHITE AND SULPHATE PULPING AND BLEACHING IN THE RESEARCH DEPARTMENT OF A LARGE NORTHEASTERN PULP AND PAPER MANUFACTURER. ALL CORRESPONDENCE STRICTLY CONFIDENTIAL. Address Box 45-744 care Paper Trade Journal. N-29

HELP WANTED

MACHINE DESIGNER preferably with experience on paper mill or paper working machinery for a permanent position. Location Phila. area. Please give complete details, age, experience, etc. Address Box 45-732 care Paper Trade Journal. N-29

PERU, SOUTH AMERICA—Opening for experienced Tour Boss under 50 to work on cylinder and fourdrinier machines in a board and tissue mill; three year agreement; transportation and modern homes provided for employees and families; special school for younger children; moderate climate. Address Box 45-733 care Paper Trade Journal. N-22

BACKTENDERS — FOURDRINIER MACHINES. SEVERAL OPENINGS IN FINE PAPER MILL MAKING RAG AND SULPHITE PAPERS AT SPEEDS UNDER 200 FEET. GIVE COMPLETE DETAILS OF AGE, FAMILY STATUS, EXPERIENCE AND GRADES HANDLED. ADDRESS BOX 45-722 care Paper Trade Journal. N-29

RESEARCH AND DEVELOPMENT — Pulp and paper specialties, coatings, adhesives, containers, pulping, etc. Chemical engineers or chemists. The Institute of Paper Chemistry, Appleton, Wisconsin. N-22

WANTED—Assistant Superintendent for small boxboard mill located in New England. Must have full knowledge of folding boxboard. Address Box 45-758 care Paper Trade Journal. N-22

MASTER MECHANIC—One machine kraft mill newly installed 1,000 fpm fourdrinier. To take charge of all mechanical maintenance work. Mill located in Texas. Permanent position. State wage desired, experience, age. All replies confidential. Address Box 45-757 care Paper Trade Journal. D-6

SITUATIONS WANTED

PULP AND PAPER ENGINEER
Many years research development and practical operating experience in the pulp and paper industry.
Have perfected method of reducing production cost and improving pulp quality.
Installation will pay for itself in a short time.
Have been employed as Consulting Engineer by large company for period of years.
Looking for connection with concern which desires to increase profits.
Prefer medium size plant having sulphate or soda process.
Address Box 45-711 care Paper Trade Journal. D-6

YOUNG MAN—EXPERIENCED OPERATOR ON THE FOLLOWING MACHINES: LAMINATING, GUMMING, COMBINING, WATERPROOFING, SHEETING, SLITTING, ROLL PRINTING, ETC. ALSO HAS COMPLETE KNOWLEDGE OF BUILDING AND REPAIRING SAME. WISHES POSITION WITH RELIABLE PAPER CONCERN. Address Box 45-688 care Paper Trade Journal. N-22

PRACTICAL MASTER MECHANIC desires position. 25 years experience on Cylinder and Fourdrinier Machines. Ability to handle help and get results. References. Address Box 45-718 care Paper Trade Journal. N-22

PRACTICAL SUPERINTENDENT on high grade folding boards. Sulphite and ground wood specialties. Test liner, etc. Address Box 45-739 care Paper Trade Journal. D-13

FINISHING ROOM FOREMAN—20 years experience on all grades of Cigarette and Carbon. 10 successful years as foreman. Experienced in managing labor. Mechanical ability. References. Available immediately. Age 38. Address Box 45-737 care Paper Trade Journal. N-22

FOR SALE

BEATERS
1—2000 lb. Holyoke-Iron Tub Beaters.
1—1000 lb. Dayton Beater.
2—400 lb. Gavit—iron tub beaters.

CALENDER STACKS
1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—Finishing Calender—3 rolls—44" face.
1—Finishing Calender—3 rolls—64" face.

CENTRAP
1—Shartle Brothers Centrap.

CONVEYORS
650'—3½" Roller Conveyor Section—18"x10'.

CYLINDER MOULDS
1—36" diameter x 84" face.
8—30" diameter x 72" face.

DIESEL ENGINE
1—60 H.P. Fairbanks Morse Diesel Engine, connected to a 40 KVA Generator.

DRIVES
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM to 418 RPM.
1—Pulmax Drive.
1—#7½ Reeve Drive.

DRYERS
23—36" diameter x 82" face.
12—36" diameter x 68" face.
13—60" diameter x 154" face.
1—48" diameter x 94" face.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
1—36" diameter x 116" face.
2—28" diameter x 68" face.

EMBOSSER
1—28" two roll Embossing Calender.

ERKENSATORS
2—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

FLAT SCREENS
1—18 plate Flat Screen, with scraper.
1—12 plate Flat Screen.
3—12 plate Murray Dunbar Flat Screens.

JORDANS
1—#2 Miami Jordan.
1—Pony Horne Jordan. Spare New Fillings.

JORDANS
1—Black-Clawson Jordan (belt driven).
1—#9 Emerson Jordan—for direct connection of a motor — requires use of 400 H.P. motor.
1—Smith & Winchester.

MOTOR
1—150 H.P. G. E. Induction Motor—3/60/220-575 r.p.m.—including starting equipment.

PULP EQUIPMENT
1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
3—Rotary incinerators—9' diameter x 20' long.
4—27" four pocket Sandy Hill grinders (for 24" wood—including 1000 H.P. motor for each, starting equipment, etc.).

PULPERS
1—#2 Lannoye Pulper.
1—Jones Pulper

PUMPS
1—Buffalo Pump—5500 g. p. m., direct connected to 100 H.P. Motor (50' head).
1—Shartle Brothers—8 x 18.
3—Worthington Turbine Well Pumps—300 g.p.m. for 14' and 16' depths—with motors.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REELS
1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—110" face.
1—2 Drum Reel—72" face.

REFINERS
2—#1 Claflin Refiners.

ROLLS
500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

SAVEALL
1—Saveall 36" x 136" cylinder mold, antifriction bearing equipped, including couch roll.

SCREW PRESS
1—Valley Iron Screw Press.

SHREDDERS
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.

SHEETERS
1—103" Hamblet Single Knife Sheeter, complete with slitting device.
1—110" Horne single knife rotary sheet cutter.
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)

SIZING MACHINE
1—36" Waldron sizing machine.

SLITTERS
1—60" Hudson Sharp two shaft Slitter & Winder.
1—72" Kidder two drum Slitter & Winder.
1—114" Two drum Langston Slitter & Winder.
1—110" Beloit slitter (slitter attachment only).
1—114" Two drum Kidder slitter and winder.
1—116" 4 drum Moore & White Slitter and Winder.
1—60" Moore & White Slitter and Winder set for 5/8" slits.
1—60" Moore & White Slitter and Winder set for 7/16" slits.
1—72" Moore & White shaft winder.
1—42" Johnstone Slitter and Winder.
1—4 Drum 108" trim Moore & White.

STACKER
1—Lewis Shepard—1000 lb. capacity—12' lift—motor included—Equipped with safety devices.

STEAM ENGINE
1—100 H. P. Ames Steam Engine connected to a 75 K. W. Westinghouse Generator.

SUCTION BOXES
1—Nash 100" face Suction Box.
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77½" drilled face.

SUCTION COUCH ROLL
1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

TRIMMER
1—40" Brown & Carver Trimmer.

WET MACHINES
1—84" 2 press Wet Machine.
2—84" Single Press Wet Machines.

We are always in the market to purchase your surplus or idle machinery. What have you to offer?

Wanted Cylinder and Fourdrinier Machines (complete mills). What have you to offer?

J. J. ROSS CO., 250 Frelinghuysen Avenue, Newark 5, New Jersey
TEL. BIGELOW 3-3720 N-22

FOR SALE

FOR SALE

FOR SALE

(Note the Name)

Ross Paper Machinery Co., 265 Passaic St., Newark 4, N. J., Humboldt 2-2177

BEATERS

1—2500 lb. Downingtown Iron Tub.
2—1900 lb. Horne Iron Tub.
1—1200 lb. Holyoke Wood Tub.

CALENDER STACKS

1—6 roll Beloit. 110" face.
1—11 roll Pusey & Jones. 104" face.
1—9 roll Rice Barton 99" face.
1—3 roll Moore & White 86" face.

CONVERTING EQUIPMENT

2—Hudson Sharp 63" Slitters and Folding Machines for converting facial tissue. With motors and starters.
1—Dietz 65" Toilet Converter. With motor and starter.
1—64½" Hudson Sharp Toilet and Toweling converter. With motors and starters.
3—Sanitary Napkin Machines. With motors and starters. Capacity 105 pads per minute each.
1—Bliss Double Head Stitcher.
1—Bliss Single Head Stitcher.
1—Bliss Box Assembling Machine.
1—66" Dietz Towel Winder.
4—Waterville Grinders.
1—36" Waldron Reeling Machine.
1—39" Dampening Machine.
1—36" Brush Coating Machine.
1—Copper Mixing Tank with agitator—40 gal.
1—Cast Iron Kettle 20" x 24" 2 outlets.

CONVEYOR

1—Standard Conveyor 30' long on wheels for handling bales of pulp. Direct connected to 5 h.p. motor.

DRYERS

1—48" diameter x 88" face.
4—60" diameter x 174" face framed and geared.
1—36" diameter x 102" face with bearings.
1—Beloit Yankee. 186" face, 12" diameter with Messinger Bearings.
18—36" diam. 82" face 2 deck frames.
40—28" diam. 96" face 2 deck frames.

EXTRACTOR ROLLS

1—Downingtown 24" diameter, 135" face, with rubber couch 18" diameter.

FESTOON DRYERS

100" Proctor & Schwartz
60" Proctor & Schwartz

FLAT SCREENS

1—Moore & White 8 Plate.
1—Moore & White 10 Plate.
1—Sandy Hill Packer 10 Plate.
1—Trimbey Pulp Screen 30 ton cap.

JORDANS

1—Dillon No. 2 Motor drive.
1—Appleton No. 2 motor drive.

KNIFE GRINDER

1—72" Seybold automatic used one year.

MISCELLANEOUS

700—Cameron slightly used Slitter Knives—$1.00 each. Purchased from a war cancellation.
3—Yankee Dryer doctor oscillators (Beloit)
2—Nugeat Oil Filters (new).
2—Beloit Fourdrinier Shakes.

MOTORS

5—1900 h.p. motors, 2300 volts with all controls.
1—30 h.p. 600 R.P.M. 2300 V. 3 Ph. 60 cy.
1—40 h.p. 3600 R.P.M. 2300 V. 3 Ph. 60 cy.

PLATERS

2—Holyoke 2 Roll 18" dia. 36" face.

PULLEYS

185—Cone Lift and Solid Cast Iron Pulleys. *Various Sizes.*

PULP EQUIPMENT

Complete Ground Wood Mill—
4—Sandy Hill four pocket Grinders. Each direct connected to 1000 h.p. motor, 2300 volts. 27" stones. Spare stones, etc. Excellent condition. Will sell all or part.
2—Pusey & Jones vertical Digesters (welded) 7' dia., 24' high 125 lb. pressure.
8—Horizontal Digesters 15' diam. 47' face 150 lb. pressure.
3—Improved No. 2 Knotters.
1—Nichols-Herreshoff Lime Kiln.
1—Williams No. 30 Bark Hog.
1—Sumner Disc Barker 72" dia.
1—36" Bauer Bros. Single Revolving Disc Mill. Direct connected to 50 h.p. motor, 3 phase, 60 cycles, 220 volts, 1160 r.p.m.
1—Carthage 4 pocket 27" grinder. Ball bearing equipment.

PULPERS

1—E. D. Jones direct connected to 60 h.p. motor with starting equipment.
1—Sturtevant Bale Pulper with conveyor & motors used three years.
1—Voith Pulper 20 tons cap.

PUMPS

1—Frederick 400 g.p.m.—60' head.
1—Pusey & Jones 5" x 8" Stock.
1—DeLaval 6" x 6".
1—Oliziti Acid 3" Suction.
1—Midwest 6" stock pump.
1—Warren Stock Pump. 400 g.p.m. 100' head.

REELS

2—Pusey & Jones 104" face 18" dia. bowls.
1—Pusey & Jones 115" face 18" dia. bowls.
1—2-bowl 100" face 20" dia. bowls.

REFINER

1—10" Wiener Refiner with Regulating Valves.

RIGHT ANGLE WORM GEAR DRIVES

1—Cleveland 2 H. P.—10 to 1 ratio.
1—Philadelphia 15 H. P.—60 to 1 ratio.
1—Oliver 5 H. P.—51 to 1 ratio.
1—Grant 2 H. P.—34¼ to 1 ratio.
1—Cleveland 2.3 H. P.—40 to 1 ratio.
1—Cleveland 1.2 H. P.—60 to 1 ratio.
1—Grant 2 H. P.—7 to 1 ratio.
1—Philadelphia 2 H. P.—600 to 1 ratio.
1—Philadelphia 15 H. P.—60 to 1 ratio.

ROLL GRINDER

1—Lobdell Roll Grinder. Will take roll 24" diameter x 160" face.

ROLLS

315—Table, Dress, Felt, Wire, Breast and Calender Rolls. *Various Sizes.*

SATURATOR

1—Guyton-Cumfer 5 gates.

SAVEALLS

1—A. D. Wood cylinder 48" dia. 60" face.
1—Dorr Company #40 ADKA Saveall 340—440 DPM. Used 1 month.
1—Dorr Company #50 ADKA Saveall 550—680 DPM. Used 1 month.

SCREW PRESS

1—Valley Iron Screw Press. Used 2 years.

SLITTERS AND WINDERS

1—88" face, two drum Warren Slitter and Winder.
1—116" Moore & White 4 drum slitter and winder with motor and starter. Will rewind 50" diameter. Complete with 3 ton Sprague Electric Hoist.
1—50" Cameron #6 Slitter and Rewinder.

STOKERS

2—Iron Fireman Pneumatic Spreader Stokers for two—300 h.p. boilers. Complete with undergrates, fans, aly ash fans, weight lory, portable car unloader. All direct connected to motors with starters. Used 1 year.

STUFF PUMPS

7—10" x 20" Shartle triplex.
1—8" x 18" Shartle triplex.
1—12" x 16" Shartle triplex.
1—12 x 12 Goulds Triplex.
1—7" x 16" Shartle triplex.

THICKENERS

1—Shartle Bros. Thickener. Cylinder Mold 72" face x 36" diameter with 16" diameter couch.
4—Improved Paper Mchy. Co. Thickeners. Cylinder mold 132" face x 48" diameter, with 24" diameter couchs.

TRIMMERS

1—65" Oswego Trimmer with motor.
1—56" Smith & Winchester Undercut with motor.
1—30" Eureka Hand Operated.

TURBINES

1—Westinghouse Turbine Generator 3125 KVA—600 volts—3 phase—60 cycle—30 lb. back pressure.
1—General Electric Turbine Paper Machine Drive. 250 h.p.—350 r.p.m. 125 lb. steam pressure.

TWISTING MACHINES

1—36 Spindle Brownell Twister with motor.

UNWINDERS

1—52" Johnstone Uniform Tension Unwinder with auto, hydraulic brakes. Used 6 months.
1—42" John Waldron Unwinder. Used 1 year.

VACUUM PUMPS

1—14" x 20" Connersville.
1—12" x 18" Connersville.

WASHERS (Beaters)

1—54" face—45" diam. with rigging.
1—52" face—52" diam. with rigging.

WELL PUMP

1—A. D. Cook 100 g.p.m. 175' head, 70 feet in well 6" drop in pipe—5¾" bronze double acting cylinder. Direct connected to 10 h.p. motor.

YANKEE DRYER

1—Beloit 186" face 12' diameter with Messinger Bearings.

AMERICA'S LARGEST BUYERS OF PAPER MAKING MACHINERY
LIBERAL ALLOWANCES FOR YOUR USED MACHINERY.
We will buy from a single item to complete mill—including real estate.

SITUATIONS WANTED

CHEMICAL ENGINEER—University graduate with 24 years of Paper & Pulp Mill experience, desires position as Superintendent or asst. superintendent. At the present time employed with one of the country's leading Asbestos and Roofing Felt manufacturers. Address Box 45-752 care Paper Trade Journal. N-29

SITUATIONS WANTED

SUPERINTENDENT—20 years experience in paper bag conversion of grocery, sacks and aniline or oil ink specialty bags. Capable of handling all bag shop problems. Thorough experience in supervision of help, maintenance and repairing of machines. Address Box 45-749 care Paper Trade Journal. D-6

SITUATIONS WANTED

ACCOUNTANT—Expert Paper and Pulp Mill Costs, thorough knowledge paper mill practice gained through twenty years in the industry, desires connection where initiative and ability will be recognized. Address Box 45-748 care Paper Trade Journal. D-6

HELP WANTED

—PAPER EXPORT—

Important established firm with ample financial facilities has opening for progressive executive to take full charge of Paper Department. Must be experienced all phases paper export. Excellent opportunity. State qualifications and previous experience in strict confidence. Address Box 45-750 care Paper Trade Journal. N-29

MECHANICAL ENGINEER

For development of equipment. Capable of assuming duties of Plant Engineer. Must understand slitting, tension, and other problems involved in production of coated papers. Chicago location. State availability and complete details of experience and education. Address Box 45-753, Paper Trade Journal. N-29

WANTED
ENGINEERING DRAFTSMEN

For design and development of insulation board mill equipment and allied machinery. Permanent position. Experience in design of paper mill equipment helpful but not required. Location South. State availability with complete details of experience.

Address Box 45-726 care Paper Trade Journal. J-3

WANTED
EXPERIENCED SALESMAN

on Fine Papers including Rag Content Papers. Good opportunity for right man to become Assistant Sales Manager after a short period. Address Box 45-725 care Paper Trade Journal. N-22

TOUR BOSS

Wanted for Mill with two small machines. Must be fully experienced in making of Rag and Sulphite Papers in Cover, Blotting and Text Papers. Experience in making of wide range of colored papers essential. Replies treated confidentially. Address Box 45-721 Paper Trade Journal, giving age, experience, family status, etc. N-29

OPPORTUNITY for Paper Chemist for permanent postwar employment by long established manufacturer in suburban Chicago area. Excellent opening for an experienced technician having knowledge of the manufacture of pulp stocks and unsized paper as well as the treatment and impregnation of paper products. Should be able to supervise production processing in small quantities. Address Box 45-738 care Paper Trade Journal. D-6

HELP WANTED

CHARLES P. RAYMOND SERVICE INC.
294 Washington St., Boston Mass.
Specializing in Paper Mill Personnel

Positions Now Open

Superintendent cylinder machine mill on tag, solid manila, specialties, etc., prefer one used to groundwood as well as paper manufacturing
Manager folding carton plant
Mechanical engineer familiar with slitting tension and similar problems in production of coated papers
Accountant $4,000-5,000 year
Young technical graduate for control work
Project engineer, drafting, installations, etc., Canadian mill $4,000-5,000 year
Electrical engineer $4,500-5,000 year to start and substantial increase for right man
Chief power engineer $7,000-8,000 year and considerably more if can make good
Board mill superintendent
Draftsmen and designers $250-500 month
Group leader and assistant for pulping and research $3,500-5,000 year
Mechanical engineer to develop into board superintendent
Chief chemist and laboratory men
Tour boss chip board and roofing felts
Paper salesmen, four openings, two must be college graduates
Superintendent set up paper box and paper board converting plant
We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. N-22

CLASSIFIED ADVERTISING

HELP WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

SITUATIONS WANTED—5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—5c a word. Double rate for heavy face type. Minimum charge $1.25.

WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

OPPORTUNITIES—5c a word. Double rate for heavy face type. Minimum charge $1.25.

Classified advertising space may also be purchased at $3.00 per single column inch.

All classified advertisements are payable in advance.

If box number is used—35 cents additional.

Address Replies to advertisements appearing under Box Numbers in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York 19, N. Y.

HELP WANTED

WANTED
TECHNICAL SERVICE REPRESENTATIVES

Large eastern chemical manufacturer has several attractive openings for graduate chemists or chemical engineers with mechanical interests and experience in the manufacture of paper or paper boxes.

Work will require traveling east of Mississippi River and introducing established and new chemicals and chemical products into the paper and paper box fields, and assisting customers in solving technical problems relative to their use.

Must have good technical knowledge and ability to make effective contacts. Age 30 preferred.

Write stating education, age, experience, present employer, salary received and salary expected. Enclose recent snapshot.

Address replies Box 45-762 care of Paper Trade Journal. N-22

DEVELOPMENT ENGINEER

Experienced in groundwood, sulphite, sulphate, papermill operation and control. Familiar with tub sizing, use of starches, glues, proteins, wet strength resins, waxes, wax emulsions. Know bleaching and stock preparation. Experienced in process development and development of special use papers. Now in service expecting immediate release. Address Box 45-698 care Paper Trade Journal. N-22

SALARIED POSITIONS

$2,500-$25,000. Reconversion is creating lifetime opportunities now. This thoroughly organized confidential service of 35 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Delward Bldg., Buffalo 2, N. Y. TF

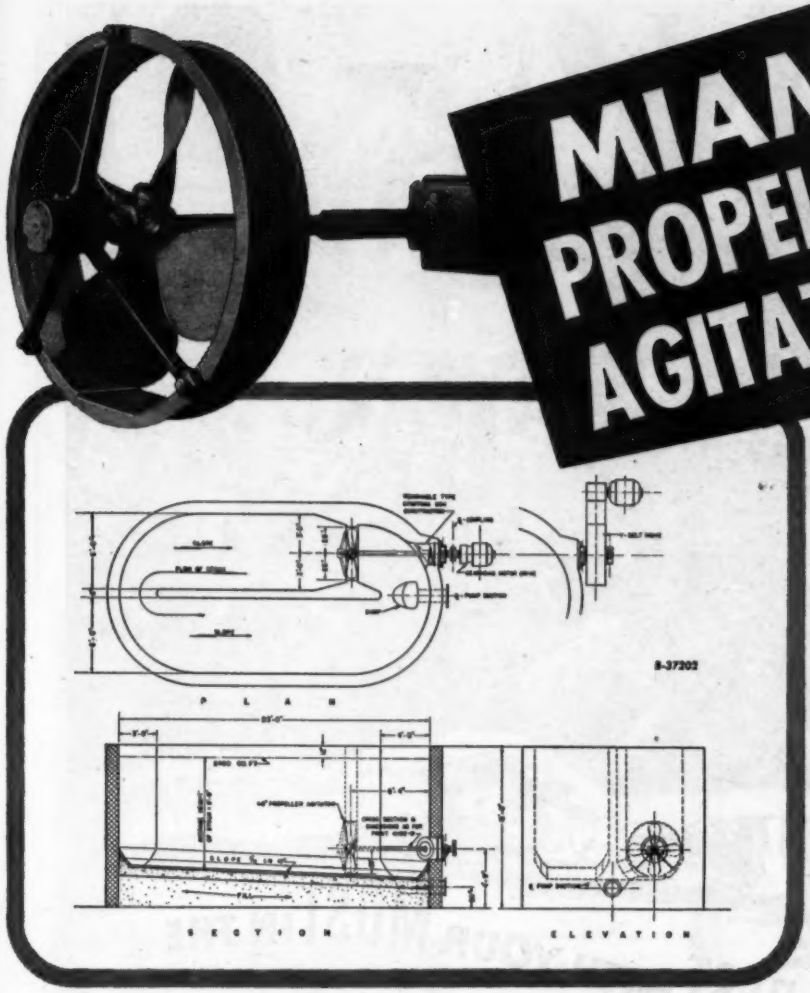
WANTED — Cost Accountant — Middle West Box Board Mill. Give age, experience and salary expected. Address Box 45-727 care Paper Trade Journal. N-29

WANTED — ENGINEERS — Capable of handling general engineering work in established consulting engineers office specializing in pulp and paper mills. Address Box 45-469 care Paper Trade Journal. TF

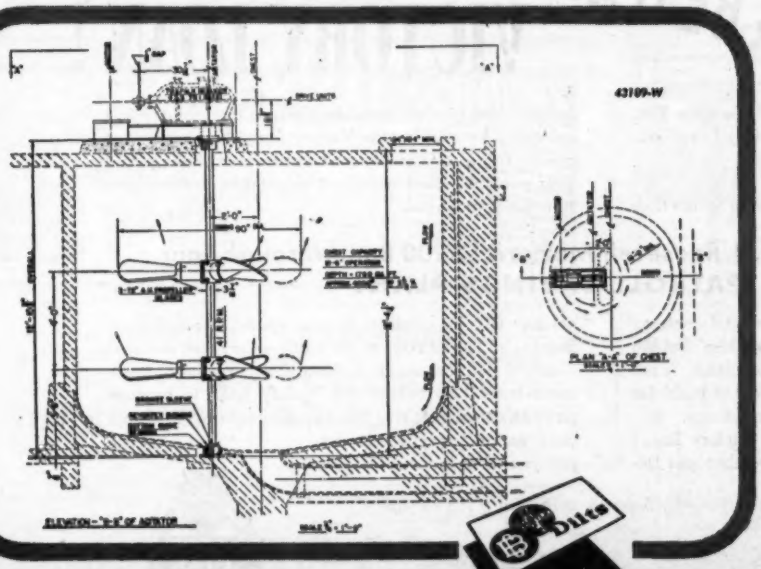
WANTED—One man to represent an Eastern paper converting mill through New York State. We will prefer one who has had some experience in paper sales, and who resides in the vicinity of Syracuse, N. Y. Address Box 45-596 care Paper Trade Journal. D-20

TOUR BOSS wanted to be trained for job of Assistant Superintendent of Roofing Felt Mill located in New Orleans. Send complete resume giving experience, etc. to Box 45-717 care Paper Trade Journal. N-29

FACTORY SUPERINTENDENT for manufacturer of grocery, sacks, specialty bags. Capable taking complete charge. Give full experience and salary. Address Box 45-755 care Paper Trade Journal. N-29



MIAMI PROPELLER AGITATION



Propeller type agitation has a definite place in the mills and is used on either horizontal or vertical chests. It enjoys a wide application for straight agitation, for blending and for flowage of stock in the channels.

We have a propeller design for almost every type of chest and the chest changes involved are usually minor changes only.

Advantages of Miami Propeller Agitation

The adjustable pitch blade permits the operator to suit the agitation and horse power consumed to exact requirements of the stock being agitated — a vernier tuning, if you please.

The full area of the chest is utilized since the bottom requires only a slight pitch — rounding of the corners only. See drawing B-37202.

In vertical agitation for blending purposes, a vertical midfeather is frequently installed in a vertical chest with the propeller at the bottom. This arrangement, called a *Hydracycle Tank*, provides the fastest blending action obtainable in any type of chest.

Also, on many chests a vertical agitator can be offset from the center to provide excellent up and down circulation. (See 43109-W.)

Yes, propeller agitation has a very definite place in all pulp and paper mills and we would like to discuss it with you.

THE BLACK-CLAWSON COMPANY
HAMILTON, OHIO

DIVS.: SHARTLE BROS. MACHINE CO., MIDDLETOWN, OHIO
DILTS MACHINE WORKS, FULTON, N. Y.
ASSOCIATE: ALEXANDER FLECK LIMITED, OTTAWA, CANADA

Now—MATCH THEIR BEST WITH YOUR MOST IN THE VICTORY LOAN!

Top off your good work on your Payroll Savings Plan with an outstanding showing in the Victory Loan—our last all-out effort!

Help bring our boys back to the homes for which they fought—and give our wounded heroes the best of medical care—by backing the Victory Loan! You know your quota! You also know by past war-loan experience that your personal effort and plant solicitation are required to make your quota.

Sell the New F.D. Roosevelt Memorial $200 Bond through your PAYROLL SAVINGS PLAN!

In rallies, interdepartmental contests, and solicitations, promote the new Franklin Delano Roosevelt Memorial $200 Bond! Better than "cash in hand," Victory Bonds enable the buyers to build for the future—assure a needed nest egg for old age.

Keep on giving YOUR MOST to the Victory Loan! All Bond payroll deductions during November and December will be credited to your quota. Every Victory Bond is a "Thank You" to our battle-weary men overseas—also a definite aid in making their dreams of home come true! Get behind the Victory Loan to promote peacetime prosperity for our returning veterans, your nation, your employees--and your own industry!

The Treasury Department acknowledges with appreciation the publication of this message by

PAPER TRADE JOURNAL

VICTORY LOAN

This is an official U.S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council.

SCHOPPER TYPE
TESTERS
TENSILE
FREENESS
FOLDING
CANADIAN STANDARD
FREENESS

TESTING MACHINES INC.
431 W. 42nd ST., NEW YORK 18, N. Y.
Old, inaccurate scales, micrometers and other testers recalibrated and made over like new.

MICROMETERS
SCALES
NEWS PENETRATION
MULLEN BURSTING
HINDE & DAUCH CRUSH
OTHER INSTRUMENTS
FOR PAPER TESTING

STAINLESS STEEL
for Paper Mills
SHEETS — BARS — TUBES — FITTINGS
ACCESSORIES
THE CONGDON & CARPENTER CO.
Providence, R. I.
Telephone—Dexter 4200
COMPLETE WAREHOUSE STOCKS

Producers of
SULPHUR
Large stocks carried at all times, permitting prompt shipments . . . Uniformly high purity of 99½% or better . . . Free of arsenic, selenium and tellurium.
TEXAS GULF SULPHUR Co. Inc.
75 E. 45th Street New York 17, N.Y.
Mine: Newgulf, Texas

AMYLIQ
the modern means for preparing coatings and tub-sizings from starch.
WALLERSTEIN COMPANY, INC.
180 Madison Avenue • New York 16

PERFORATED METAL SCREENS
MADE SPECIALLY FOR PAPER and PULP MILL USE
Copper, Bronze, Steel, Stainless Steel and other metals, Heat-treated.
HENDRICK MFG. CO.
90 Dundaff St., Carbondale, Pa.
Offices in Principal Cities

MISCO "C"
THE CORROSION RESISTANT ALLOY
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for all equipment exposed to corrosion by sulphite acids
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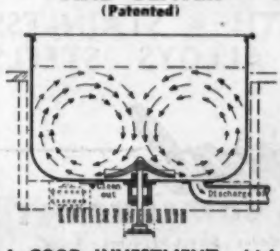
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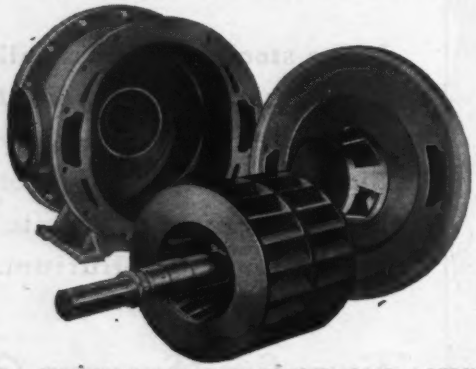

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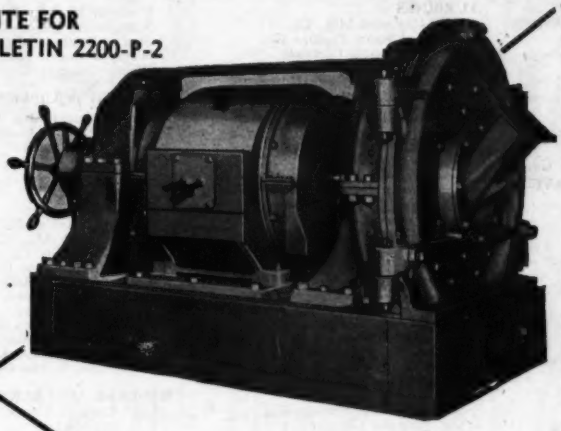

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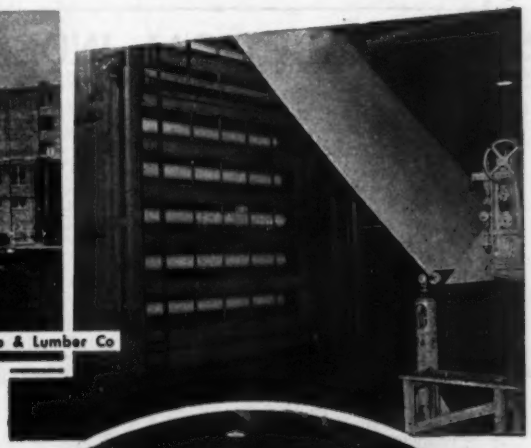

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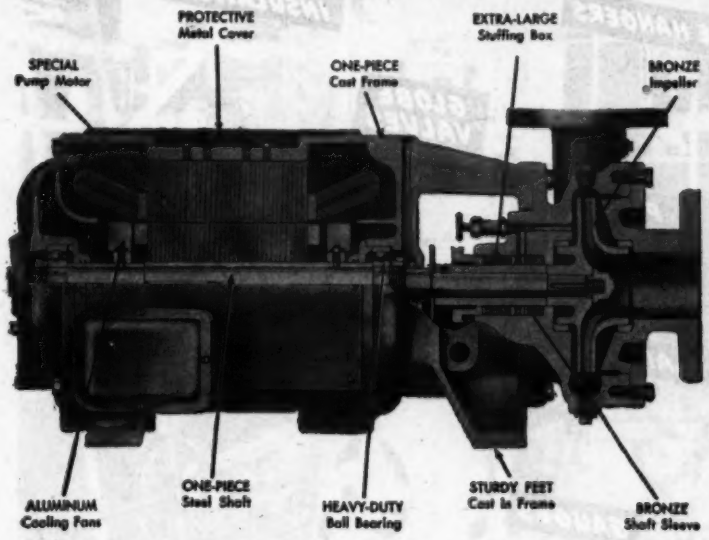
X-Ray View

Shows Why A-C's Smooth-Running Electrifugal Pump is the Finest of its Kind!



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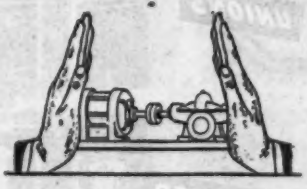

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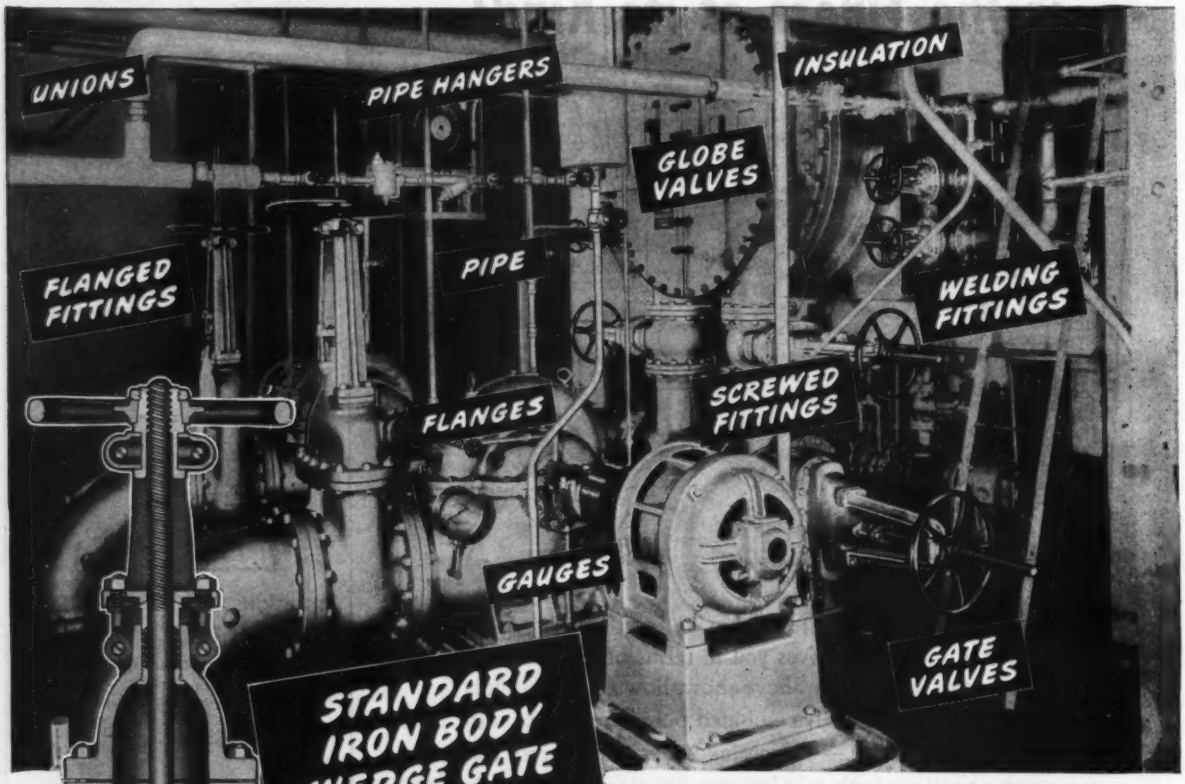

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